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WESTERN CANADA'S FOREMOST HORTICULTURAL ANNUAL

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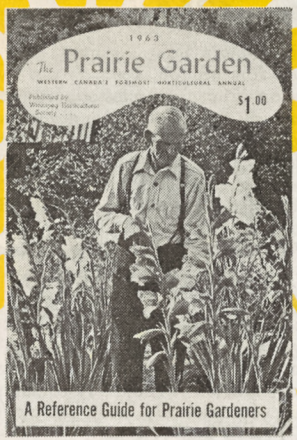
"To the best of my knowledge there is no hard-cover how-to-do-it textbook written especially for our conditions, but there is a good substitute in THE PRAIRIE GARDEN, *the paperback annual yearbook published by the Winnipeg Horticultural Society. It is more like a once-a-year garden magazine than a textbook, but by buying and saving each yearbook as it comes out, it is possible to build up a very good working library on our kind of gardening. It is filled with interesting and highly practical articles, all written by folks who do their gardening right here on the prairies."*

Are you a newcomer to our Prairie Garden family? If so, here is your opportunity. We still have a fair number of THE PRAIRIE GARDEN, 1963 and 1964 available. Price 75c each postpaid. Content headings are listed below. Send your remittance to THE PRAIRIE GARDEN, 92 Queenston Street, Winnipeg 9, Man. All previous issues are sold out.



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The Prairie Garden

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The Prairie Garden, 1965

As each succeeding spring arrives the prairie gardeners have assumed the habit of looking for their new issue of THE PRAIRIE GARDEN. This edition, 1965, is the twenty-second. The annual book is becoming more and more an all-prairie publication, catering to those who grow plants from the eastern shadows of the Rocky Mountains to the evergreen country by the Lake of the Woods. It is gratifying to the editorial committee, appointed by the Winnipeg Horticultural Society, to receive expressions of approval from citizens in many walks of life and right across the Great Plains. The most convincing indication of the usefulness of the book is the greatly growing demand for it. You will aid materially in the further improvement of THE PRAIRIE GARDEN by directing your many friends to it for sound helpful reading. All who perform in the garden will find benefit in its pages.

This book is one of the real bargains. Nobody makes a financial profit from it. The committee and writers serve without recompense other than what is probably the greatest of all, the feeling of having done a kindly act to our fellows. It is the only horticultural publication of its kind on the Canadian prairies. It grew out of a widely sensed need. Its success rises from the substantial articles written by outstanding authorities and skilled home gardeners, spiced up occasionally with inspirational touches such as The Essence of Gardening by H. S. Fry in this volume.

Have a banner year with your garden plants! Let the Editor know if there is some subject you would like to find in the 1966 issue. The aim is to have successive issues complement those produced before, thus building up a reference library that will be referred to very frequently, and with full confidence.

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The Essence of Gardens

by **HAROLD S. FRY**

Harold S. Fry was born in the Niagara fruit belt and now is living in retirement at Beamsville, Ontario.

After graduating from the Ontario Agricultural College, Guelph, he was on the teaching and research staff of the Horticultural Department for some years. He later branched out into journalism and was editor of three different Canadian Farm journals, including the Country Guide. Always horticulturally minded, he played a prominent part in the formation and growth of the Western Canada Society for Horticultural as well as filling the important national role of President, Agricultural Institute of Canada.

I sing of brooks, of blossoms, birds and bowers:
Of April, May, of June, and July-flowers.
I sing of times trans-shifting; and I write
How roses first came red, and lilies white.

Have you ever wondered just why so many people appear to be fond of flowers, shrubs, and other more or less ornamental plants, including trees? Is it only because flowers, as a rule possess beauty and trees often attain magnificence? Is it because all such plants are a part of Nature and that Nature is life in all its infinite variety? Is our liking for gardens perhaps a by-product, or an off-shoot, of our interest in gardens as sources of food? In all probability the latter came first, because history and archeology have made it clear to us that not too far back in the life history of the earth, man was almost entirely preoccupied with securing enough to eat.

We do know that as far back as written history goes, and also as far back as biblical history would take us, gardens have been popular. Francis Bacon the seventeenth century English philosopher and statesman wrote:

> "God first planted a garden. And, indeed, it is the purest of human pleasures: It is the greatest refreshment to the spirit of man, without which buildings and palaces are but gross handiworks. And a man shall ever see that when ages grow to civility and elegance, men come to build stately, sooner than to garden finely, as if gardening were the greatest perfection."

Napoleon I was probably wiser even than he knew, when he said: "Wherever flowers cannot be reared, there man cannot live." And another, a poet, testified to the value of gardens when he wrote:

> "Gardeners have rare opportunities of thinking,
> Watching how queer things grow."

The theory of evolution, as we think of it today, is credited to the English naturalist Charles Darwin, whose "Origin of Species" published in 1859 argued that nature has provided for differences between parents and offspring, and that from these differences, coupled with environmental influences, new types of plants, different as to variety or species, may gradually evolve. It thus appears to be somewhat the same with plants as the Irishman said of people: "No two uv thim are alike, and both uv thim are glad uv it." Notwithstanding Darwin's great contribution, however, Marcus Aurelius, stoic philosopher and

Roman Emperor, seems to have been thinking along the same line, though much more vaguely, when he wrote, 1600 years earlier:

> "Nature, which governs the whole, will soon arrange all things which thou seest, and out of their substance will make other things, and again other things from the substance of them, in order that the world may be ever new."

No one so far has been able to pinpoint the actual beginning of gardening. Noah, it is said, was proficient in the growing of vines; and Jacob likewise in the production of vines, figs and almonds. Solomon, the wise one, excelled in making gardens, orchards and vineyards. It would appear also that substantial numbers among the ancient Assyrians, Egyptians, Chinese, Greeks and Romans were experts in the making of gardens and the cultivation of fruits and vegetables. Their principal crops are reported as having been the Vine, Fig, Pomegranate, Walnut, Almond, Medlar and Quince. In addition they also grew lettuce, cucumber, melons, onions, leeks and garlic.

The famous Hanging Gardens of Babylon were a great wonder of the world, with their twenty plateaux one above the other, resting on walls 22 feet thick. The Romans not only were keen gardeners, producing many vegetables, and understanding manuring and forcing, but after subduing the early Britons, they planted vineyards and orchards of apples, pears, figs and mulberries in Britain. The pioneer gardeners of the Middle Ages were probably the monks, whose education and habit of traveling enabled them to bring skill to gardening, and also to bring back new plants to their home areas.

Nearly all of us have become aware of the fact that in the plant world, Nature exhibits herself in a very wide variety of forms. As a rule we grow up with this fact and acknowledge it more or less unconsciously. The probability is that very few people really have much concrete idea of this variety. For example, how large is the smallest flowering plant; and how large is the biggest? The smallest is believed to be the duckweeds that grow on the surface of ponds; the fronds, or leaflike parts of these plants are from a fiftieth to a thirty-fifth of an inch long. On the other hand, the largest of all blooms are to be found in the Malaysian jungle and belong to the parasitic stinking corpse lily. The blooms are 3 feet across, are ¾ inch thick, and weigh 15 pounds. Another case of extreme size is the world's largest blossoming plant. It is said to be the Giant Chinese Wisteria at Sierra Madre, California, which, planted in 1892, now weighs 252 tons, has branches 500 feet in length, covers an acre and during its 5-week blooming period, has an estimated 1,500,000 blossoms.

Few of us, probably, have much of an idea of how large a tree can become. Well, the most massive living thing on earth is said to be "General Sherman," a California Sequoia, with a circumference of 101 feet 7 inches; a total weight, roots and all, of 1,320 tons; bark up to 24 inches thick in parts; and having the equivalent of 600,120 board feet of lumber (35 5-room bungalows), and a maximum base diameter of 34 feet.

The most spreading plant known anywhere is believed to be the wild box huckleberry found in Eastern Pennsylvania, a single clonal growth of which has spread over as much as 3 acres. The oldest living thing is believed to be a Bristlecone pine. These grow in the White Mountains of California, of which 17 trees have been established by ring count to be over 4,000 years old, and the oldest of them over 4,600 years old, which means that it began its growth in 2,640 B.C., or 700 years before the Bible-reported covenant between God and Abraham.

And so it would be possible to go on and on. We all know that there are many different kinds of house plants, but how many have counted them. We recently secured a bulletin prepared by the Department of Horticulture of the Ontario Agricultural College (now part of the University of Guelph), dealing in some detail with the care of each of many kinds of House and Gift Plants. Out of curiosity we counted them and got a total of 80. Had we counted the different individual forms under such groups as cactus and begonia, the number would probably have been around 100. Quite recently also, we learned that the largest concentration of flowering plants to be found anywhere in the world is believed to be in Cape Province, South Africa, where the total is 2,600 species of indigenous wild flowers.

At the beginning of this article we asked a question about the reason for our general liking for flowers and gardens. The question now is: Have we found the answer? My own view is that a contributor to the Spectator (London, England) of September 6, 1712, Dion Clayton Calthrop, reached a conclusion which would be about as satisfactory to the majority of gardeners now as it was 253 years ago. With this opinion we leave the matter to the readers of The Prairie Garden:

"You must know, Sir, that I look upon the Pleasure which we take in a Garden, as one of the innocent Delights in human life. A Garden was the Habitation of our first Parents before the Fall. It is naturally apt to fill the mind with Calmness and Tranquility, and to lay all its turbulent Passions at rest. It gives us a great Insight into the Contrivance and Wisdom of Providence, and suggests innumerable subjects for Meditation. I cannot, but think the very Complacency and Satisfaction which a man takes in these Works of Nature to be a laudable, if not a virtuous Habit of Mind."

If the front door or the picture window is on the east or the north side of the house, low-growing evergreens may be used to advantage.

Do's and Don'ts in *Homeground Landscaping*

by **GUNTER A. SCHOCH, *N.L.I.***
Landscape Assistant
Metro Parks & Protection Division
Winnipeg, Man.

The publication of the Manitoba Department of Agriculture and Conservation *Landscape your Grounds for better Living, by Fred J. Weir, Provincial Horticulturist, has proved to be a valuable and comprehensive guide for many home owners for the past 2 years. All the important facts and hints to successful residential landscaping have been combined on the 16 pages of this publication.

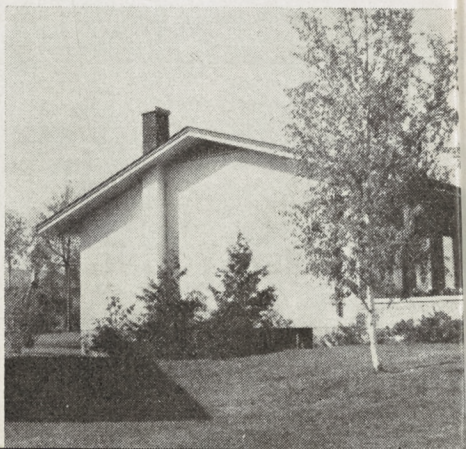
It is unnecessary to add to the contents of this fine brochure. However, to underline some of Mr. Weir's important statements, the following additional photographs and sketches have been collected, especially for the readers of THE PRAIRIE GARDEN.

*Pub. 357, Publications Branch, Manitoba Department of Agriculture and Conservation, Norquay Building, Winnipeg 1, Man.

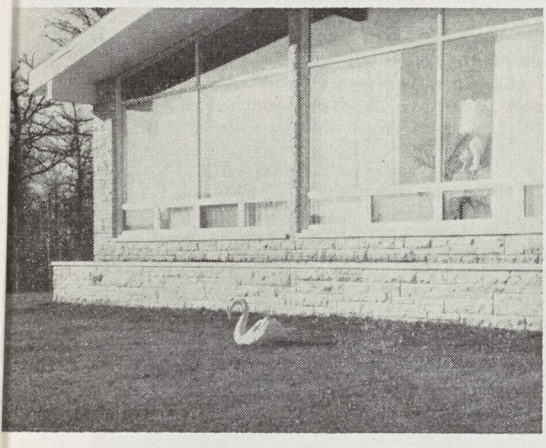
Large, blank or windowless walls, found in many modern homes, should be covered by plantings.

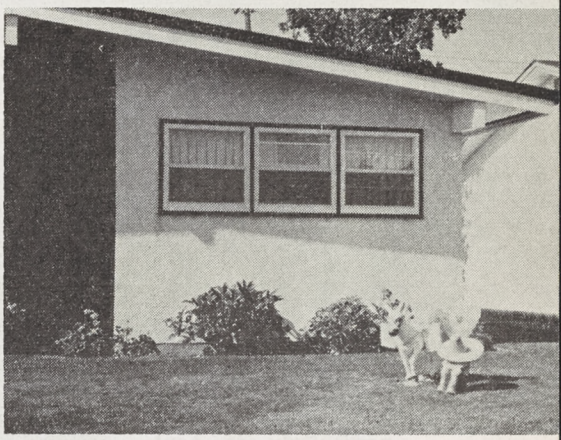
◁ ***Poor***

Good ▷



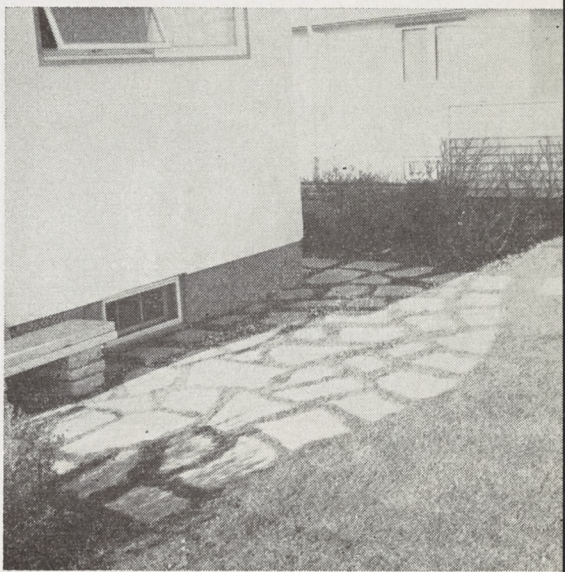
It is important that shrubs planted below windows will not interfere with light coming into the house. Trimming of taller shrubs or evergreens is never satisfactory.





Many home grounds have been well developed, but the improved appearance and value have been lowered by the addition of sets of artificial birds, animals and other figures. These may be interesting and eye-catching, but detract greatly from the overall picture.

Much greater use is made of the outdoor living room when the patio is constructed of stone, concrete or other permanent surfacing. A lawn area is attractive, but little use can be made of it immediately following a rain, and it is easily worn out where there is much traffic. A completely solid surface is easiest to maintain but many home owners prefer a flagstone patio since it blends perfectly into the landscaped surroundings.

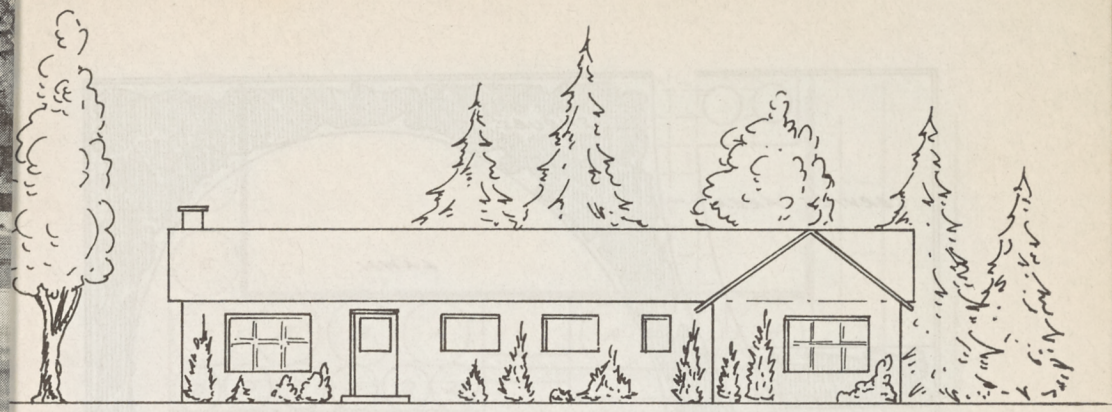


Driveways and walks should be straight unless curves are required to allow a tree to be retained.

Planting larger shrubs or small trees in a small front lawn is not in good taste, and usually is not necessary, particularly if boulevard trees have been planted by the municipality.

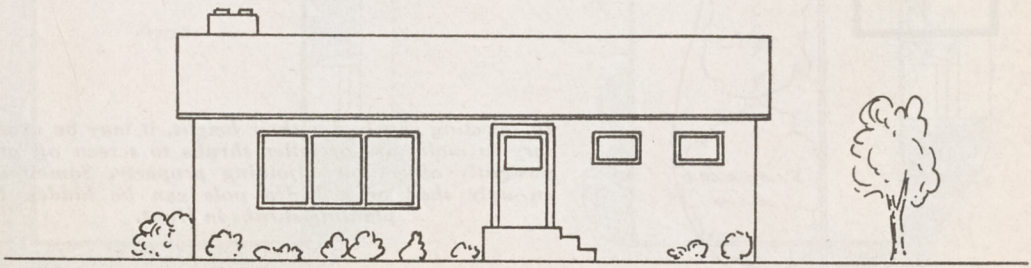
To provide immediate shade for patio area or terrace use can be made of a canopy or roof attached to the house.

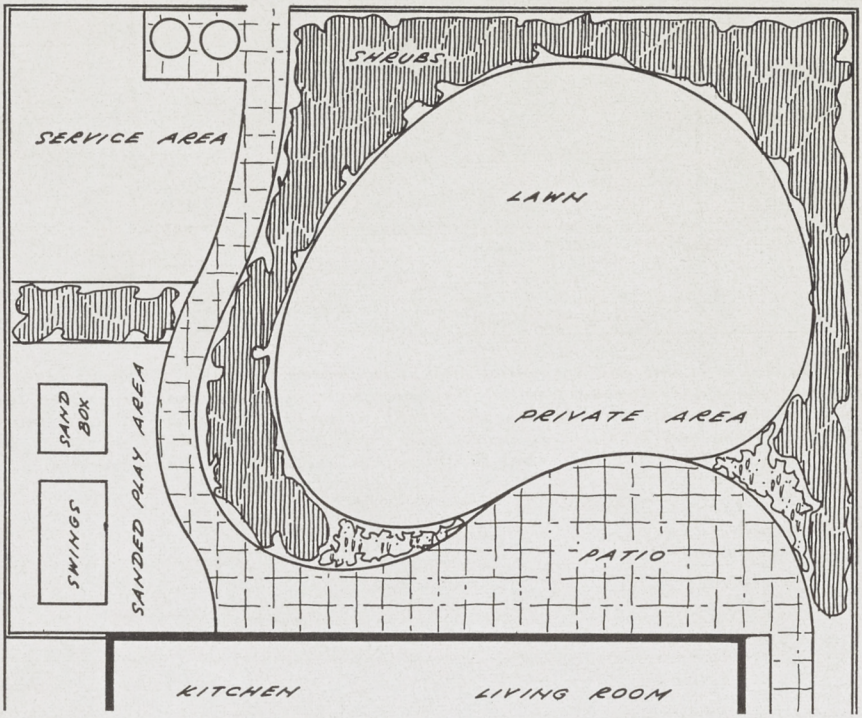
The lawn should be kept as a broad, open expanse and will look much larger and more spacious if allowed to merge into the neighboring lawns with no border plantings close to the street.



If the house is low and spreading, and it is desired to make it appear higher, corner plantings may be planted far enough from the corner to expose the vertical house line. In addition shrubs of pyramidal form which have more vertical lines can be used. It is not necessary to have identical plantings on either side of the door, but the plantings should show some balance.

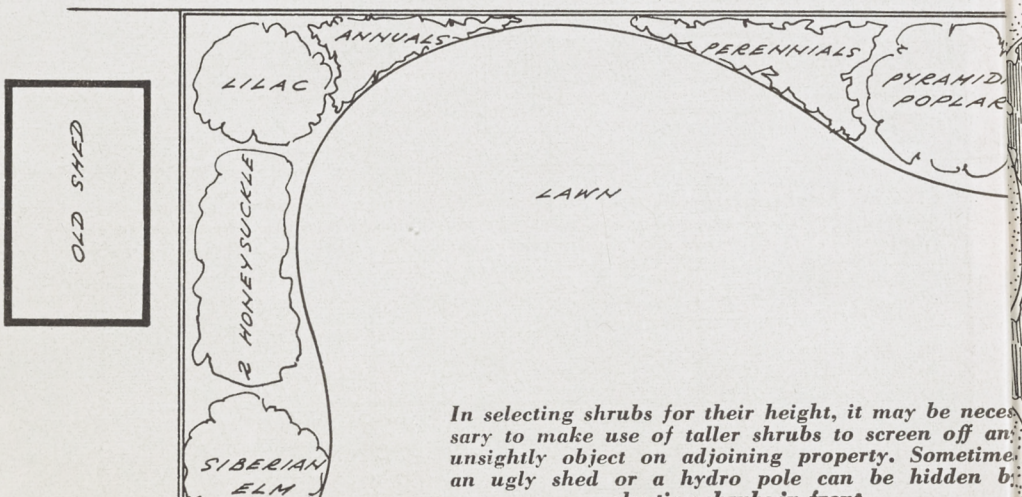
Ultimate heights of shrubs is an important factor in a selection for foundation purposes. If those chosen grow too high, the house itself may be dwarfed in comparison. If they are too small, they will not be seen, or will not perform the duty expected of them.



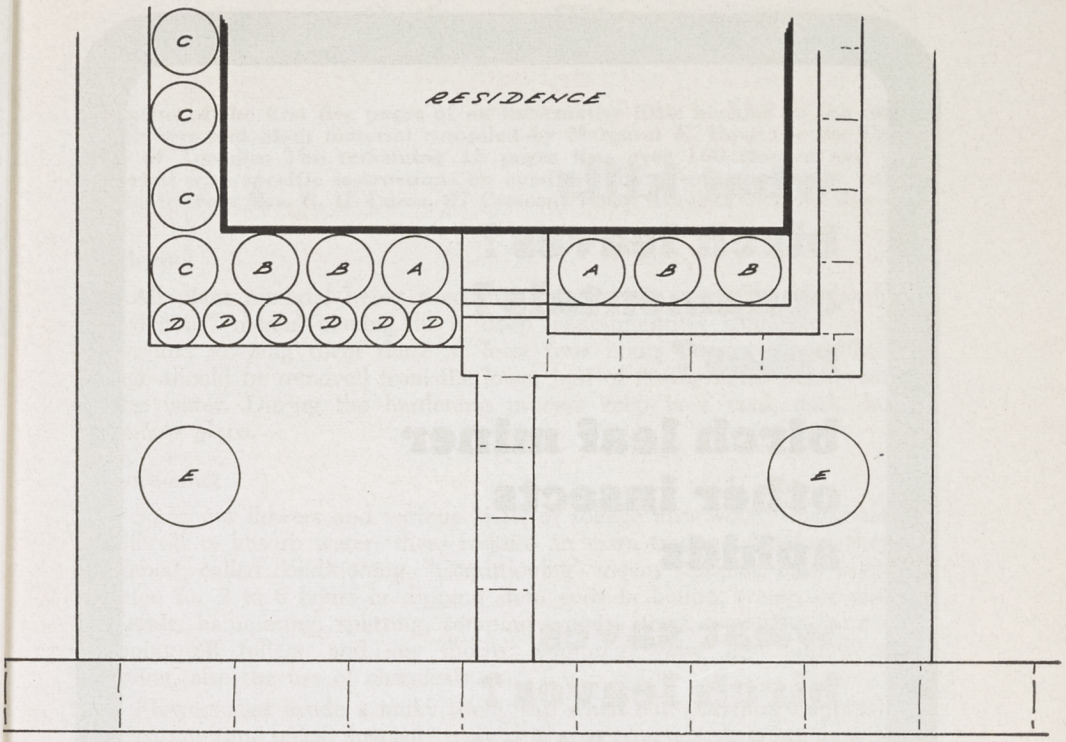


If possible or practical the service area should be, at least partially, screened off from the private area by suitable shrub material. This is best done by using groups of shrubbery, rather than solid hedges or screens. If there are little children some play equipment could be provided. It is important that these be situated so that the children's activities can be scanned periodically from the house windows.

HYDRO P

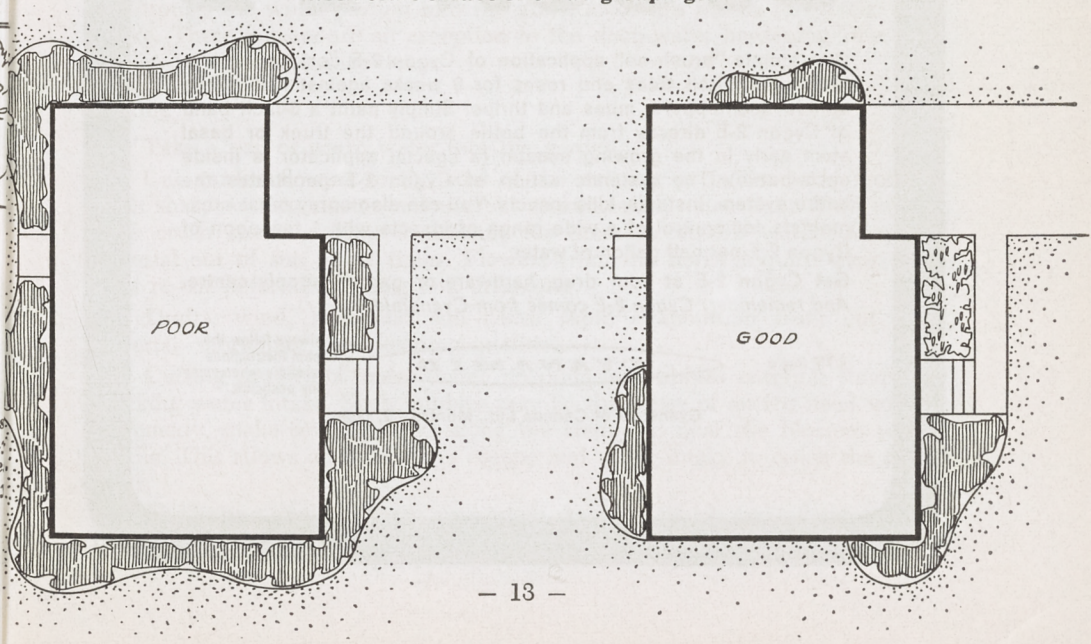


In selecting shrubs for their height, it may be neces sary to make use of taller shrubs to screen off an unsightly object on adjoining property. Sometime an ugly shed or a hydro pole can be hidden b planting shrubs in front.



If straight lines are used, more formal types of plants have to be selected and more attention given to keeping them formal. A—Pyramidal Cedar; B—Peking Cotoneaster; C—Prinsepia Cherry; D—Globe Caragana; E—French Lilac.

If the foundation is attractive the public should see part of it, and so it is inadvisable to plant a hedge of shrubbery around the house to hide the foundation completely. Preferably, allow the lawn turf to come up to the foundation between some shrubs or shrub groupings.



what kills
birch leaves?
ornamentals?
roses?

birch leaf miner
other insects
aphids

what saves
birch leaves?
ornamentals?
roses?

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One simple "brush-on" application of Cygon 2-E completely protects your birch trees and roses for 8 weeks against leaf miner, aphids, leafhoppers, mites and thrips. Simply paint a 6-inch band of Cygon 2-E directly from the bottle around the trunk or basal stem early in the growing season (a special applicator is inside each bottle). The systemic action of Cygon 2-E penetrates the entire system, instantly kills insects. You can also spray most ornamentals for control of a wide range of insects with 1 teaspoon of Cygon 2-E per half gallon of water.

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Snippy Tips

A reprint of the first five pages of an informative little booklet on the care of cut flowers and plant material compiled by Margaret E. Dove for the Garden Club of Toronto. The remaining 15 pages lists over 160 flowers and plant materials with specific instructions on conditioning after gathering or cutting. Available from Mrs. G. H. Lucas, 87 Crescent Road, Toronto 5. Price 50c each.

Hardening

All plant material being used in arrangements must first be hardened. "Hardening" means placing in a deep wide-mouthed container of warm water and keeping them there at least four hours, longer if possible. All foliage should be removed from the lower half of flower stems before soaking in the water. During the hardening process keep in a cool, dark, humid, draft-free place.

Conditioning

Some cut flowers and various kinds of foliage also woody materials find it difficult to absorb water; these require an extra treatment before they are hardened, called conditioning. "Conditioning" means standing in a suggested solution for 2 to 6 hours or dipping stem ends in boiling water, or charring the ends, hammering, splitting, scraping woody stems, complete immersion, stripping off foliage and any thorns, pumping water into hollow stems, spraying, also the use of chemicals.

Flowers that exude a milky sticky sap when cut (Oriental Poppies) will not last any time unless specially treated; their stem-ends must be immediately charred. All such "bleeding" stems require this special treatment each time they are re-cut.

Flowers with woody stems (lilac and buddleia) have the leaves stripped off the stems leaving only those near the flower heads; they also require their stem-ends hammered or slit.

Bulbous flowers having white stem ends should have a vertical cut made up through the white portion into the green area; this makes for better water intake. These flowers are an exception to the deep-water hardening rule; they harden in water 3 inches deep.

Cutting

Take a pail of warm water into the garden.

Cut garden flowers in the cool of the evening or in the early morning. With sharp cutting shears or knife cut stems cleanly on a slant. Dull cutting tools crush stems making it difficult for them to absorb water. Keep cut material out of sun at all times. Flowers from the florist require their stem-ends re-cut before hardening and arranging.

Drafts, wind, heat and sun cause rapid evaporation from cut plant material, shortening their keeping qualities.

Cutting stem-ends under water prevents air bubbles entering stems and blocking water intake. Such bubbles may be the cause of an iris head wilting; to remedy, make several pricks along the stem and near the blossom with a needle. This allows air bubbles to escape and water intake to reach the flower head.

For lasting qualities there are certain stages at which some flowers should be cut:

Tulips—for straight stems, first opening of blossom.
Roses—when buds are on the verge of unfolding the outer petals.
Rudbeckia—in the evening in full bloom.
Dahlias—in the evening in full bloom.
Iris—when first and second bloom are the size of an egg.
Poppies—the night before they open.
Peonies—as outer petals unfold.
Gladioli—when first bud opens fully.
Most other flowers just before reaching full bloom.

Grooming Tips

Keep containers and holders clean. The use of table salt (not iodized) helps some flowers absorb water more readily. Sugar acts as a nutrient and prolongs the life of cut flowers.

Wilted fresh flowers may be revived by placing 3 inches of their stem-ends in hot water; leave there until cool then add tepid water up to flower heads and leave until material has revived. Protect blossoms from any steam by covering with a towel.

Special florists' conditioners such as Floralife are useful to prolong the life of most cut flowers. Aspirin is of no value.

To keep the stems of spring-flowering bulbs and calla lilies from curling back, wrap with raffia or string. As soon as garden lilies are cut carefully remove the stamens bearing pollen; such pollen stains petals, clothes or skin. Tuberous begonias, carnations, roses, lilacs, gardenias, violets and many other flowers like a fine mist spray of cool water before hardening. Never allow a drop of water to touch the petals of camellias, delphinium, sweet peas, orchids, lilies, or petunias; these will become spotted if sprayed. Materials which wilt rapidly once cut need total immersion in cool water, preferably overnight. Tender new tips of rose foliage, calla lily foliage, ferns, hosta, chard, broccoli and rhubarb, all useful in flower arrangements, will along with many others benefit from complete immersion overnight.

Snapdragon, stock and lupin placed at an angle when being hardened will turn their end tips upward; resulting curves offer greater opportunities for arrangers.

Fresh pussy willow stems take desired curves readily if first soaked a few minutes in tepid water before shaping.

To repair the drooping heads of hollow-stemmed flowers such as zinnias, plunge the pointed tip of a toothpick straight through the middle of the bloom down into the stem.

After pruning and shaping cut branches or stems for desired lines in an arrangement, rub the cut surface with a piece that has been cut off; this darkens the cut and makes it inconspicuous.

Wash broad-leaved evergreen foliage in lukewarm soapy water, rinse in clear water; when dry rub gently with a piece of crumpled florists' wax paper to produce an attractive dull gloss. Florists' liquid wax applied to foliage will clean and polish at the same time.

Tie fine-stemmed flowers such as clarkia, pansies and violets in small bunches rather than using them singly in arrangements.

The Garden Club of Toronto now has another little booklet "SNIPPY TIPS—2" covering the drying of flowers, plant materials and the preservation of foliage. Price 50¢ from the same address.

Planning Next Year's Garden

by **ISABELLE and CHARLES YOUNG, F.R.H.S.**
Calgary, Alta.

Mr. and Mrs. Charles Young are two of the most active and successful gardeners in the Calgary area. They have won many trophies for their efforts. A few examples: Presto Trophy—most points in garden competition and show; Herald Trophy—best composite garden; Birks Trophy—most points in horticultural show; Harry Jacques Trophy—Champion Sweet Pea Grower; the pictures of their garden shown in this issue clearly demonstrate their art.

They are also very active members of the Calgary Garden Club executive. Mr. Young is in charge of the garden column in the Calgary Albertan to which both Mr. and Mrs. Young contribute numerous articles.

Before you start planning your garden let us decide what you want in the way of a garden. How much time and effort and money you are willing to allot to the garden. Each person's idea of an ideal garden differs so be sure to plan your garden to realize your ideal as closely as possible, but be sure that your ideal garden actually is what you want.

For example, do not say that you want a garden that takes a minimum of care and then complain because at times it is a little drab; on the other hand, do not plan a prize-winning garden and then complain of the time and effort it takes. Do you want a garden for your own enjoyment — an addition to your outdoor living room — then try plants in tubs and pots which can be moved around to suit the occasion, or be changed from time to time.

Why not try a rock garden combined with a waterfall and a lily pool! A rock garden takes planning and making, but once made requires a minimum of attention and is a delight to both eye and ear. If the pool is large enough to have a reflecting surface its mood will change hour by hour and day by day, and the sound of trickling water will make the hot summer days more endurable. In addition, a rock garden possibly offers the greatest scope for those with a small space.

Our own garden is a prize-winning garden in which we try to have a blaze of color from early spring to late fall with a great variety of color and form and texture, and yet unified so that it is not just a hodge podge. It is a garden where there is something for all the senses, for the eye, the ear, the nose.

Try to have some movement in your garden. Trees, a waterfall, a reflecting pool or fish in a pool will give you this directly, but movement can be achieved without these just as it can be achieved in a flower arrangement. At any given viewpoint in your garden try to have a focal point for vision and vistas that move out from that focal point to encompass the whole of the scene.

Why not try a bed of double stocks which are pleasing to both eye and nose! Too many people neglect scent in a garden. The perfume does not have to be strong but just a whiff of a delightful scent is enough to make it a pleasure to be in your garden. Try some of the night-scented plants, night-blooming stocks *(Matthiola bicornis),* or night-blooming nicotina *(N. affinis, syn. Malata),* in an inconspicuous part of your garden for scent in the evening. And what about birds! One house we lived in had a long, thick caragana hedge which housed several pairs of humming birds. Do you have any fruit that will attract the birds in the fall and winter? This should give you some ideas.

The time to start planning a garden is the summer before. Make a plan

of your garden to scale. If you use graph paper ruled 12 to the inch you can use a scale of 1 inch to the foot and plan in great detail if you wish as it provides room to show individual plants. This can be a great help in estimating the number of plants that you will require. On this plan mark in ink all the permanent features of your yard, i.e., house, garage, walks, trees, shrubs, perennials, etc., showing in dotted lines the ultimate size of trees, shrubs, etc.

This is your permanent record. Over this plan place a piece of thin white paper and trace all the permanent features on it. On this paper you can plan next year's garden during the fall and early winter. Get a box of colored pencils and color the groups of flowers that you lay out in their natural colors, and if possible indicate their height and season of bloom. A bed of mixed colors of one flower is effective now and again but usually separate colors can be arranged much more effectively.

Generally, the tallest plants go to the back of a bed and the shortest in front, but arrange them in groups and bring some of the taller ones forward a little so as not to have too much uniformity in height. Never put tall plants in front of shorter ones. Watch for color harmony and do not have too many colors in any one bed. Some of the rules of flower arranging can be used here. Have *one* predominating color for a bed, and two or three contrasting or harmonizing colors. If the main flowers in your bed are round-flowered such as asters, zinnias or marigolds, etc., provide contrast by having some spike flowers such as snaps, stocks, celosia, etc.

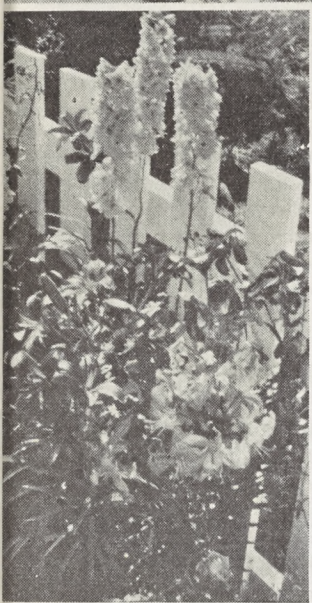
What about using some foliage plants for contrast! Have you ever grown any of the silvery gray Dusty Millers, that is *Centaurea candidissima,* or one of the *cinerarias Maritima (C. m. candicans, or C. m. Diamond)*? The last named has almost pure white foliage. These are very effective as an edging around a bed.

While each bed should be planned as a unit, there should be some repetition in nearby beds to bring the whole garden into harmony. Most annuals time of blooming can be altered to some extent by the time at which the seed is planted, so be sure to keep records of the time of seeding and of planting, and you will soon have a reliable guide for the future. In addition you will be adding to the store of horticultural knowledge for your area. The flowering period of most plants can be prolonged by picking off all faded blooms immediately.

There are a number of viewpoints that should be given special consideration in laying out a garden. What do the public see as they pass down the street? Go across the street and take a good look at your garden. Does it look as good from there as you think it should? The view from your living room window in particular! What is it like? And what about the view from the kitchen window? The housewife spends a great deal of time in the kitchen, and the view from the window should be something special.

What about the view from the back gate? I hope it offers something better than garbage cans. How do the sides of your house look? Have you tried climbers to soften the outlines of your house? If you haven't grown *Clematis,* particularly the variety Jackmanni and its hybrids, you have a treat in store. It will grow 15 feet or more in a season and in early June has grown a measured 32 inches in 72 hours. During July, August and most of September it will be a mass of flowers so profuse that very little foliage is to be seen, and after a few years it is dense enough that birds actually will build nests in it on occasion.

What about an arbour in a protected location with an easterly or north-easterly exposure for begonias! These are such gorgeous-looking plants and grow well in such a situation. The blooms may not be quite exhibition quality



Scenes from the

Isabelle and Charles

Young

Garden

Calgary

but they will win you many compliments. Plan surprises, eye-catchers, throughout your garden. In shrubs, plant those which have eye appeal all year. The Rosybloom crabs in particular and also the mountain ash, to name two, are very good. They have attractive foliage which colors in the fall, have lovely flowers in the spring and fruit that stays on most of the winter to delight both you and the birds. Consider seriously whether you can afford shrubs like lilacs which bloom only for a short period and then have nothing to contribute for the rest of the year.

Well, you have your garden planted and in bloom. Does it meet with your complete satisfaction? Probably not! Take heart, it can be more beautiful next year. Keep notes of your triumphs and your failures, and particularly of your almost triumphs, the things that didn't quite come up to your expectations. We planted a border of white matricaria and red petunias along the front walk some years ago, but the first year the matricaria was planted too late so it didn't come into bloom until late in the season. The next year the matricaria was put in earlier and it did fine but it overwhelmed the petunias, so the third year we put the matricaria a little farther apart and started the petunias a week earlier and we had what we had planned in the first place, but this would not have been possible if we had not kept exact records of what we had done and pictures of the border at various times during the summer.

For this a plan of your garden with exact notes on height of the plants, when they started to bloom, and any other pertinent information, are necessary. If this can be supplemented by color slides of your garden that you can study during the winter so much the better. Take pictures and notes of the view from all points, and general views of the garden so that when fall comes you will be in a position to plan your garden intelligently for next year.

Above: Leaves of American Elm curled by the woolly elm aphid. At right: Rosette of leaves of American elm caused by woolly apple aphid.

Aphids on Ornamental Trees and Shrubs

by **A. G. ROBINSON, Associate Professor**
Department of Entomology, University of Manitoba, Winnipeg, Man.

Aphids occur on many of our ornamental trees and shrubs in the prairie provinces. Usually they are found on the terminal growth where they suck the plant sap, and in the spring season may seriously retard growth of infested branches. Some species occur on the leaves where they may cause curling, leaf galls or other deformations.

An article in THE PRAIRIE GARDEN (1964, p. 61) described a generalized life history of aphids so I will repeat only one statement that is pertinent to the present discussion: some species of aphids spend all their life history on one species or genus of host plant, while other species of aphids spend the autumn, winter and early spring months on a perennial tree, shrub or herbaceous plant, and the remainder of the year on another kind of plant (often an annual).

Two species of aphids are often conspicuous on leaves of American elm. No detailed study has been made locally but workers elsewhere have demonstrated that the woolly elm aphid, *Eriosoma americanum* (Riley), is the species which causes the edge of the leaf to curl over; and the woolly apple aphid, *Eriosoma lanigerum* (Hausmann), causes elm leaves to cluster or to form a 'rosette'. Inside the curled leaves or rosettes large numbers of aphids may be found, usually powdery in appearance and associated with small droplets of their excretion, known as honeydew. The aphids leave the elms usually by mid-summer, reportedly for a few weeks on saskatoons, but the unsightly leaves remain until winter arrives.

In some years the undersides of leaves of boxelder or Manitoba maple are infested with very large numbers of the boxelder aphid, *Periphyllus negundinis* (Thomas). Leaves turn yellow and may fall prematurely. On our urban streets automobiles are often coated with the honeydew excreted by these aphids which falls in very tiny droplets of sticky, sugary material which is difficult to remove. Similarly, undersides of leaves of the bur, or Manitoba oak, may in some years have heavy infestations of the clear-winged oak aphid, *Myzocallis punctata* (Monell). Leaves turn brown and unsightly.

Ornamental evergreen trees are relatively free of aphids although our forest conifers often have large numbers on needles or branches. Occasionally one will find the needles of terminal growth webbed together by the balsam twig aphid, *Mindarus abietinus* (Koch), or pineapple-shaped galls caused by adelgids which are closely related to aphids. No large infestations of aphids have been found on ash, birch, or mountain ash in urban plantings. The various poplars and willows in their native state have many species of aphids and there are occasional reports of aphids on these trees in home plantings. It may be of interest to note here that the aphid often found on dill at pickling time spends the winter on willow and the summer on dill or other *Umbelliferae*.

Of the aphids on ornamental shrubs, perhaps the worst pest is the snowball aphid, *Neoceruraphis viburnicola* (Gillette). Overwintering eggs hatch on snowball, and the young aphids cause the leaves to tightly twist and curl. Some individual plants may have every leaf deformed and unsightly. Winged aphids in late spring migrate from the leaves to a summer host as yet unknown, but the curled leaves persist for the remainder of the season. In autumn winged migrants return to the winter host and from their descendants come the eggs which overwinter on the twigs. The snowball aphid occurs also on other Viburnum ornamentals.

Four or five species of aphids occur on dogwoods, especially *Cornus stolonifera*. Most of these species cause terminal leaves to curl very tightly. If one unwinds a cluster they will find many little, reddish-brown aphids which usually are attended by ants. One of the species, *Aphis neogillettei* (Palmer), remains on dogwood all season. The other *Aphis* spp. depart for unknown summer hosts, although there is conflicting evidence that they may go to either sunflower or fireweed. This is a small problem which I am presently investigating, so far without success!

Some of our varieties of spiraea often have the growing tips badly damaged by dense colonies of the spiraea aphid, *Aphis spiraecola* (Patch). I have seen terminal growth of spiraea killed by this species, 6 to 8 inches back from the tip. The black bean aphid, *Aphis fabae* (Scopoli), overwinters on many of our shrubs. Usually it can be recognized as the very black aphid found in colonies on the terminal growth of cranberry, snowball or mockorange. This species occurs in many countries of the world and has many different summer hosts. Locally it rarely causes noticeable damage to shrubs.

In the spring there occurs on hawthorn, cotoneaster and apple an aphid known as the apple-grain aphid, *Rhopalosiphum fitchii* (Sanderson). Leaf edges are curled inwards by small, greenish aphids. Winged migrants soon leave these shrubs. We have been able to rear these winged migrants in the greenhouse on wheat, oats or barley, but we have not been able to state definitely that they occur all summer in our grain fields because the summer forms are very similar morphologically to another species of aphid which migrates from chokecherry to cereal grains.

The caragana aphid, *Acyrthosiphon caraganae* (Cholodkovsky), may be found on terminal growth of caragana in the spring, and sometimes in large numbers on the seed pods when they have formed. This is a large, green aphid very similar in appearance to the pea aphid which is so troublesome on sweet peas in the home garden. The caragana aphid remains on its host all the year. It is believed to have been imported into this country many years ago when caragana was first introduced, possibly on hardwood cuttings. There are early reports of occasional serious defoliation of caragana in Saskatchewan and Alberta but apparently it has been present in smaller numbers in recent years.

Leaves of golden currant and other *Ribes* spp. often have reddish blisters on them. Underneath, in the depressions of the blisters, may be found the currant aphid, *Cryptomyzus ribis* (Linnaeus). A very few aphids underneath a leaf of currant may cause the disfiguration and discoloration of most of the leaf surface. We do not know the complete life history of this aphid locally. Summer hosts reported elsewhere do not grow on the prairies and it is believed that it probably remains on *Ribes* spp. all summer in very low numbers locally.

The only shrub on the prairies which I know to be free of aphids is lilac. Two species may be found on honeysuckle. One or more species may occur on plants of *Elaeagnus, Symphoricarpos, Hippophae, Rhamnus* or *Prunus* when planted as ornamentals. The list is almost endless!

However, most gardeners are more interested in how to destroy aphids than in the many scientific names and the unusual life histories and habits of these most interesting insects. Sprays of malathion or nicotine sulphate are still recommended. On elm, oak or maple, due to the large size of the trees and the lack of suitable spraying equipment, one usually ignores the infestations. Trees once well established will tolerate considerable damage either from insects sucking sap or from caterpillars eating leaves.

Where shrubs are concerned, the most important spray is the first one which should be applied just as the first leaves begin to burst from the leaf buds. This will kill most of the 'stem-mothers' which have hatched from overwintering eggs on the twigs. This is especially true for the snowball aphid, or the aphids on dogwood, because once the leaves have curled the colonies inside are well protected. Undersides of leaves should be sprayed even more thoroughly than the upper surfaces because most aphids are found on leaves on the undersides.

A very recent and promising development for control of aphids on ornamental trees and shrubs is the use of systemic insecticides. Chemicals introduced into the plant through applications to leaves, stems or roots make the plant sap poisonous to the aphids. A new product known as menazon (Sayfos) is being introduced in 1965 to be applied as a granular material to the soil, from which it will eventually be taken up by the roots, and into the plant sap. Perhaps this material, or similar chemical products applied systemically, eventually will provide an answer to control of aphids on ornamentals.

Three Insect Defoliators of Broad Leaf Trees

by **D. R. ROBERTSON**
Provincial Entomologist, Winnipeg, Man.

Whether it be a favorite shade tree in the backyard, a stately shelterbelt, an aspen grove, or native forest, chances are that some of nature's beauty will be destroyed by insects when these trees come into leaf this spring and summer. In recent years three insects in particular have been a menace to deciduous trees on the prairies, namely, fall cankerworm *Alsophila pometaria* (Harvo), forest tent caterpillar, *Malocosoma disstria* Hbn. and aspen leaf beetle, *Chrysomela crotchi* Brown.

Fall surveys conducted by the Canada Department of Forestry, Winnipeg, indicate that we might expect a decline in general distribution and abundance of these insects in 1965. Heavy infestations, however, are likely to occur in isolated pockets with the severity of any infestation dependent upon a number of factors including weather, activity of parasites and presence of disease.

Mature larvae of the fall cankerworm

Fall Cankerworm

Small green caterpillars hatch from overwintering eggs on tree branches in May. They feed on the undersurface of the leaves of most deciduous trees, especially box elder, oak, poplar, ash and fruit trees. As the caterpillars, known as loopers because they crawl in a looping manner, grow and the season progresses, defoliation occurs until sections or all of a tree may be completely defoliated.

A characteristic of the caterpillars is their habit of dropping from the tree on a silken thread when disturbed. A simple technique therefore of checking a tree which is suffering leaf damage for cankerworms is to shake the tree or branch and the caterpillars which otherwise may not have been recognized, will be seen readily, hanging from their silken thread. When the caterpillars are full-grown they drop to the ground and enter the soil to pupate. The adults which are brownish grey moths emerge from the soil in late September or October and the wingless females crawl up the trees to deposit their eggs on the stems, branches and twigs.

Forest Tent Caterpillar

This insect pest is usually found in the forested areas and aspen groves but does on occasion become a visitor to urban areas. As an example, mass flights of moths occurred in the Winnipeg area one week end last summer and very heavy egg laying took place. Egg masses or bands were deposited in vast numbers on trees in the Winnipeg area. Unless Mother Nature reduces

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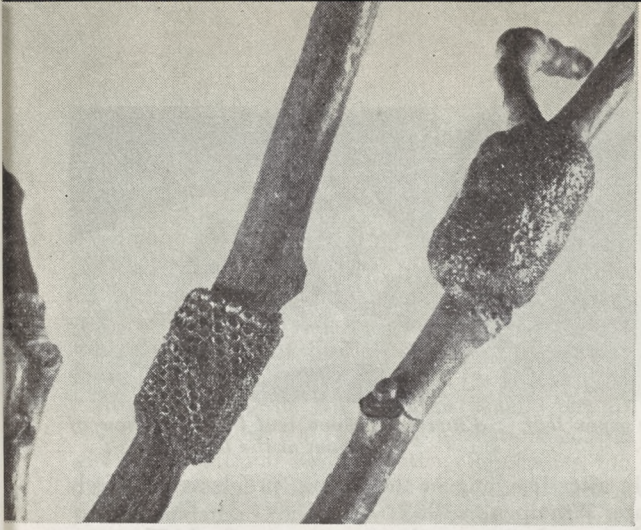
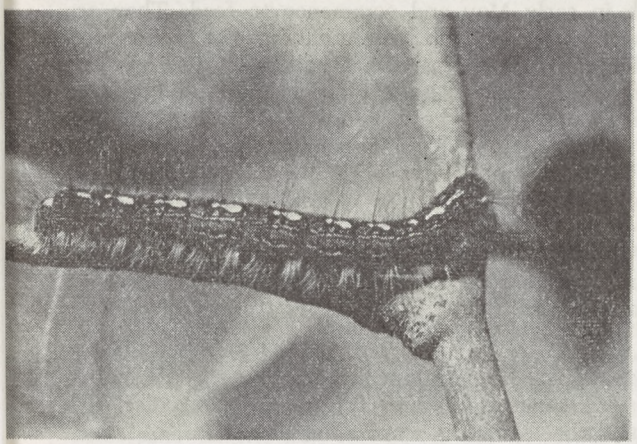
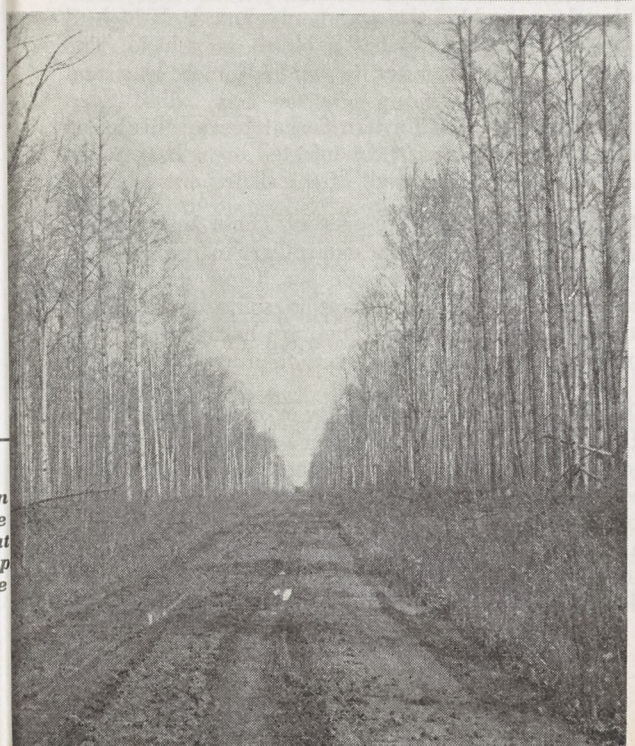
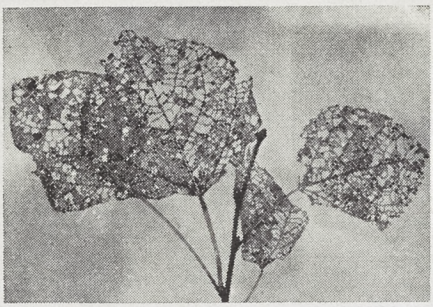
Forest Tent Caterpillar

Top left: Egg-bands showing how protective coating laid by female is broken when hatch. Top right: Young larvae (caterpillars) emerging from egg band. Note fine bing. Center left: Full grown caterpillar. Center right: Adult moths with male at Bottom left: Stand of trembling aspen trees completely defoliated by the caterp about the end of June. Bottom right: Wandering caterpillars congregated on a fence
Pictures courtesy of Canada Department of Forestry

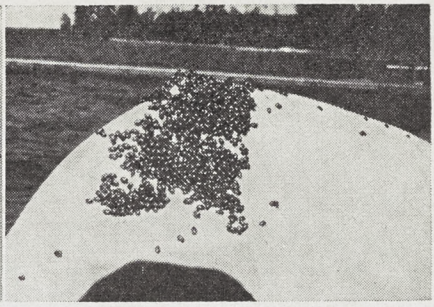








Poplar leaf skeletonized by aspen leaf beetle



Cluster of aspen leaf beetle on bow of a boat at the beach

the population immediately after hatching in the spring, problems are likely to develop in parts of Greater Winnipeg in 1965.

The caterpillars hatch in early May and commence to feed. They are hairy greyish blue larvae which often move in large numbers in search of food like an army marching. They have been a particular nuisance to cottage and property owners in the forested resort areas of the northern and eastern prairies. Not only are trees damaged but the presence of such vast numbers of these crawling worms is most alarming and disconcerting to the general public. In parts of the Whiteshell Resort Area of Manitoba in recent years some cottage owners have found rubber boots a necessity to literally wade through the hordes of forest tent caterpillars that have occurred.

As the name implies, so called tents are formed by this insect and these silken cases, containing large numbers of the pest, may be seen attached to trees in late spring and early summer.

Aspen Leaf Beetle

Both the adults and larvae of this insect pest are defoliators of the native aspen. In contrast to the fall cankerworm and forest tent caterpillar, this insect skeletonizes leaves and the leaf veins remain untouched.

The adult aspen leaf beetle resembles the commonly known lady bird beetle in size and shape. It is a tan color and has a bluish grey head. The larvae are black in color and about one-quarter to one-half inch long and pointed at each end.

In many parts of Western Manitoba and Eastern Saskatchewan this insect has been particularly abundant. Aspen groves in the infested areas have taken on that barren, cold look in the summer as a result of the skeletonized leaves.

Some Interesting Aspects Connected with the Presence of These Insects

Because of the high populations of forest tent caterpillars in recent years, there has been a build-up in numbers of a parasitic fly. These grey brown flies, larger than the house fly, are now so abundant in some districts that they are more of a nuisance than the caterpillars. They are harmless and will do no damage, however, unless one is an insect lover, their presence is not appreciated.

The aspen leaf beetle for some unknown behavior pattern will congregate and die in fantastic numbers around the water's edge of lakes. The beach-going public have been frustrated on many occasions the past few years to find their favourite week end habitat invaded by myriads of these dead and dying defoliators of our native aspen.

The fall cankerworm, because of the adults hatching late in the fall encounters cold weather conditions for egg-laying activities in some years. This was the case in 1964. As a result, the wingless females may be seen

some years depositing eggs on the sunny exposure of a house or building late in the fall on a bright sunny day. The small clusters of grey egg masses can readily be seen on white stucco.

Control

Of the three pests discussed in this article, the fall cankerworm is the one requiring control most often. Because it attacks shelterbelt trees and trees on boulevards or in the home garden, its damage has more direct effect on people. In these areas, too, it is possible to take effective control, whereas with the aspen leaf beetle and forest tent caterpillar, the forested areas it infests most frequently present a formidable task to cope with satisfactory control. These pests are therefore usually left to the control of nature.

For the latest control recommendations contact your Provincial Entomologist or Agricultural Representative. Remember, too, that if you use an insecticide, be careful when applying it. Insecticides are poisonous so follow the recommendations for use on the container label very carefully.

"Prairie Garden No Place for Old Folk . . .?"

by **JOHN H. MARTIN, Medora, Man.**

Dear Dad,

Why don't you quit your garden and come to the city? Your room is ready.—Son Bill.

Frosty August 13th, 1964

Dear Son,

Thanks for your letter, but what gave you the idea that I was ready to quit. Sure I grumble when things don't go just as I would like them to, but heck!, that's part of the game, with gardening no exception.

You send for a dozen glads (mixed), only to find on cutting that you have eleven whites and one red. It's the same with dahlias, unless gotten through a reliable source. Little things too, like a cold, late spring, wind, hail, dogs, field mice, hoppers, assorted bugs, etc., even two-legged little darlings, bless their hearts, that run across the flowerbed; but all these hazards help break the monotony of daily living in Old Age.

No matter how many hard winters we old flower lovers live through, every spring about March, Green thumbitis starts your blood throbbing through your limbs, and out you go, searching for the first little green shoot to pierce the ground, some long before the snow disappears.

Now what in the world would I do in a one-room home in the city? And where would I get flowers for my vases, and what about the shut-ins that kind of depend on me for their flowers. No Sir, when that dear old saint at the pearly gate beckons, I want to be on my feet, with the sweet smell of Mother Earth already on me. I like to sit in the garden and smell the sweet rocket, nicotine, evening stock, as the season advances, and the pungent smell of the tomato patch acts as a tonic to me too.

Wonder are there any flowers in Heaven? For when you look in the face of a lovely rose, or a glad, in fact hundreds of other blooms, it's not hard to realize that man himself could not have created the original cast, and little blooms like the Twinkle phlox surely must have fallen to the earth as stardust.

Anyway, Son, I need the garden and the garden needs me, and sure I know I have to be careful in regard to the old ticker, but I can't see where pushing the lawnmower in pure country air is any harder on the ticker than pushing through those swinging doors found in most city stores.

You know the old saying, Son: "Because there's snow on the roof, it doesn't mean that there isn't still lots of green on the thumbs."

Love from Dad.

Spider Mite Injury on Dryland Plants

by **PERCY H. WRIGHT, Saskatoon, Sask.**

It has been known for years that spider mite injury is most serious on leaves that are not growing at all, or not growing fast, but the season of 1964 in northern Saskatchewan brought a striking illustration of the truth of this relationship.

Never before have I seen such severe damage to raspberry plants, rose plants, and the dozen or more of the common plants grown by prairie gardeners. Apparently, to reduce spider mite injury to a minimum, all we need do is keep our plants well watered and hence growing at a reasonable rate.

The catch is that this is hard to do when it fails to rain and one's garden or home grounds are in a location where they cannot be watered. If we have water, we put it on without the additional motive of wanting to check the spread of the mites. If we have no water, what can we do?

We can try a miticide spray, but the simple truth is that mites are hard to control by spraying, no matter what the miticide used. The webs under which they hide and do their depredations afford considerable protection from the effects of any toxic material we care to apply. However, if a spray that is kept on hand for other purposes will also do the trick when it comes to handicapping the mites, hesitation in using it will be much reduced.

Malathion appears to be such a spray material. It has lethal effect on so many insect enemies, and poses so temporary a threat to the general insect population, that every gardener is likely to have it on hand, either pure or in a mixture with DDT. Malathion has not generally been regarded as a miticide, but I have found it of value, and the entomologists apparently are beginning to take note of it as effective.

But everyone prefers not to have to use a spray of any kind if he can avoid using it. What cultural practices help to keep the mites at bay, apart from the all-important one of watering freely?

The answer, of course, is shade, or rather partial shade. I observed a raspberry plantation this past summer where some of the raspberry canes had been tied together in bunches for mutual support, and even the small amount of shade that one cane threw on another was a considerable aid in reducing the extent of mite injury.

Any plant that grows in the wild state as an undercover in a bluff of trees seems to be susceptible to spider mite when moved into a location with full sun. Probably seedlings of white spruce, growing up to take their place as the top storey of the native vegetation at some future date, are aided, in their competition with larger trees, by the semi-shade which discourages the mites.

In point of fact, the spider mite on spruces is almost certainly the most destructive of all, with the spider mite on raspberries in second place. The spider mite is serious enough, in all districts where the air is dry, to make one hesitate in planting white spruces at all, unless he has a plentiful supply of water or is willing to spray. The Colorado spruce seems to make an appreciably better job of fighting off the mites. White spruces cannot stand both drought and spider mite injury, but can meet reasonable drought with fair success if free of the mites and of their companion pest, the pineneedle scale. The trees never have to meet spider mite injury in the absence of drought, for moisture is the natural destroyer of spider mites.

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Weed Control in Turf

by **A. C. FERGUSON**
Department of Plant Science, University of Manitoba

Whenever the subject of weed control is mentioned the picture that flashes across the minds of most gardeners will be one of chemicals and sprayers. With some there may be a feeling of satisfaction at thoughts of a weed-free crop, garden or lawn. Others unfortunately will have a feeling of frustration at having spent time and effort spraying, only to have their ornamentals deformed or dead and possibly their neighbors threatening law suit. It is one of the signs of our times that we tend to think of weed control only in terms of chemical control. While the value of chemical weed control is recognized it is the purpose of this discussion to put things in their proper perspective at least insofar as turf is concerned.

Weeds invade turf only when the grass has been weakened for some reason or other, and unless the basic cause is corrected, applying chemicals to a weedy lawn may further weaken the grass and hence complicate the problem. A weedy turf is a sure sign that conditions are not favorable for growth of the grass plants. If the grass is vigorous the weed population will be light.

A good turf is dependent upon a favorable climate, suitable soil and good management. In general the climate on the prairies is favorable and the soil adequate but too often management is poor or lacking.

Let us consider the major management items:

Mowing. Many turfed areas are consistently mowed so short that the limited top growth severely restricts both rhizome growth and root development. The turf then becomes sparse and may even die out in places thus providing space for weeds to grow. Ordinary turf should not be cut lower than 1½ inches and preferably not more than ½ inch of the top growth should be removed at any mowing. Turf exposed to heavy traffic should be cut at 2 inches.

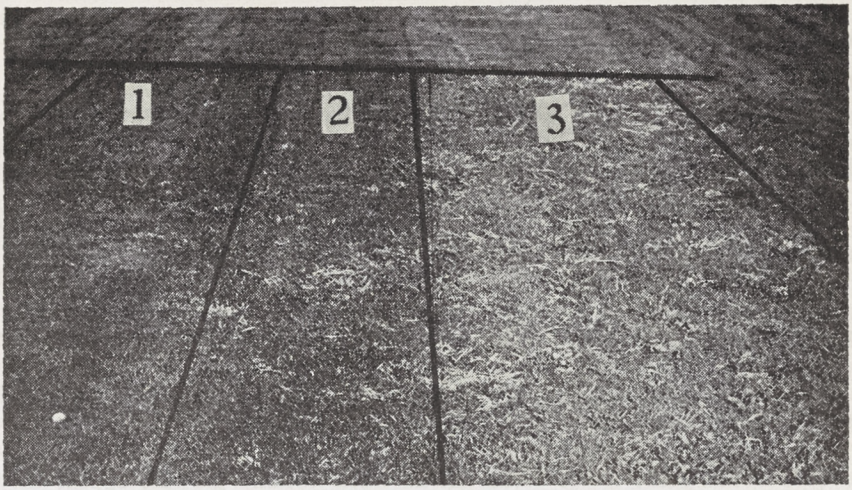
Watering. "Too little too often" encourages shallow rooting and thin stands are a natural consequence. Kentucky bluegrass turf should receive not less than 1 inch of water per week during the summer months, preferably in one or two applications.

Compaction. All areas subjected to heavy traffic eventually become compacted and unless steps are taken to remedy this situation the grass will suffer badly. The heavier the soil the more extreme will be the compaction. Grass roots develop poorly in compact soil because of a lack of oxygen and reduced moisture in the soil. The plants recover slowly if at all from injury and weeds take over. Aerifying these areas with hollow-tined aeration equipment is recommended to ensure moisture and air penetration to the rooting area.

Fertilization. Probably the most common cause of sparse stands of grass is the lack of nutrients, usually nitrogen. Turf grasses are heavy users of nitrogen and will not compete well with weeds unless adequate supplies are available. Lawns, golf fairways and playing fields that are overrun with clover and other weeds are starved for nitrogen. Spring, early summer and fall applications of up to 5 lb. of nitrogen per 1,000 square feet per season are recommended for lawns, golf fairways and playing fields.

Chemical Control of Weeds. Sometimes in spite of good management certain weeds will appear in turf. The problem is one of removing these weeds

NITROGEN EFFECT ON THE WEED POPULATION IN NEWLY SEEDED KENTUCKY BLUEGRASS TURF



Plots indicated by the heavy black lines were seeded May 27, 1964. Photographs taken September 30, 1964.

Plot 1—33-0-0 at 10 lb. N/1,000 sq. ft. applied August 27. Only a few weeds, 33 days after treatment.

Plot 2—33-0-0 applied September 16 at the same rate. A somewhat larger weed population apparent 14 days after treatment.

Plot 3—No fertilizer. Barnyard grass and a various assortment of broadleaf weeds are competing well with the grass.

with the least effort. Hand weeding may be resorted to and if the area infested is small this can be effective. However, in most cases hand weeding is time-consuming and tedious. Weeding with chemicals under these circumstances is highly recommended.

Some of the more common weeds with the recommended chemical controls are as follows:

1. *Dandelion, plantain, shepherd's purse*: 2,4-D or MCPA amines at 1 ounce (2 tablespoons) to 4 gallons of water applied to 2,500 square feet.

2. *Clovers, chickweed and knotweed*: Clover in turf indicates a lack of nitrogen; chickweed takes over in areas which are too shady for most lawn species; knotweed invades compacted areas. Correct the causes and spray with mecoprop (CMPP), silvex (2,4,5-TP), or brushkill (2,4-D + 2,4,5-T) at the rate of 1 ounce to 4 gallons of water applied to 2,500 square feet.

3. *Quack grass (also called twitch and couch)*: this very persistent and aggravating weed cannot be controlled in turf by application of herbicides without killing the desirable grasses. A Kentucky bluegrass turf which is kept healthy by good management will tend to keep quack grass under some control.

Prior to seeding a new lawn, Amitrol at ½ ounce per 100 square feet will give good control of quack grass with short-term residual effect. Cultivation of the treated area three weeks after treatment is necessary.

4. *Weeds in new seedings*: common farm weeds such as stinkweed, barnyard grass, pigweed, etc., usually will be quick to appear in newly seeded grass areas. Under no circumstances should herbicides be used on new seedings

until the grass is at least 8 to 10 weeks old. Picking the weeds by hand will do more harm than good because for every weed pulled, up to hundreds of grass seedlings may be destroyed.

The only satisfactory way to control weeds in newly seeded grass is to practice good management—fertilize, water and mow as outlined earlier.

Precautions Necessary When Using Herbicides

Most herbicides used in turf weed control are highly toxic to ornamentals and other desirable vegetation and therefore to avoid embarrassment and loss a few simple precautions should be taken:

1. Do not allow spray to drift—use only when there is little or no wind.
2. Use the proper herbicide for the job. Highly volatile chemicals should not be used.
3. Use large droplet spray nozzles and apply at low pressure.
4. Sprayers used for herbicides should not be used for other spray purposes.
5. Clean the sprayer well after each use.

Remember: Chemical control of weeds in turf is only an aid to good turf management. A well managed turf will be a weed free turf.

SNOW MOULD. If the characteristic white cottony growths appear they should be broken up immediately by raking or by brushing with a stiff broom. On lawns where the disease is known to be prevalent, it is good policy to add a mixture of ⅔ calomel and ⅓ bichloride of mercury, at the rate of 3 ounces per 1,000 square feet in the late fall. Semesan applied at the rate of 2 pounds per 6,000 square feet also has produced excellent results in the control of snow mould. *J. H. Boyce.*

"Why Do My Glads Turn White?"

by **THOS. KILDUFF, Assistant Superintendent**
Horticultural Station, Brooks, Alta.

In sheer self defense I feel I should "talk out" this business about glads "turning white." Over the past twenty-plus years, in building up the Brooks gladiolus collection from a small backyard hobby planting to over one thousand named varieties on about one-half acre, I have not seen one "turn white." Or, for that matter any "turn" from one color to any other color. It's very frustrating! Especially when so many other growers are able to come up with this accomplishment so easily. Must be doing something wrong!

In flowers, color changes or "sports" do occur in all types of plant material, and the gladiolus is no exception to natural laws. However, a "sport," whether in color or in some other single character, occurs only in one plant among several hundreds of thousands. This single plant that has "sported," assuming that it is a color break to white, may then be multiplied normally and may be named as a new variety. Such a "sport" or mutant will have all the other characteristics (size, form, blooming period, health and growing habits) of the variety from which it "sported." Plant mutation is a normal biological happening, relatively infrequent in occurrence, and obviously not an answer to the question "why do all my glads turn white?"

There is an explanation, however, for the quite frequent occurrence of an increasing percentage of whites in a mixed planting of varieties. This is due largely to differential survival, and greater reproductive vigor in many white varieties. The older commercial whites are quite healthy and regularly produce two (or more) corms for each one planted.

Got a jolt this season when one visitor asked: "Why are my glads turning yellow?" Explanation was that a vigorous and healthy yellow variety in the collection was out-surviving and out-propagating the other varieties.

Carefully kept records are the only basis for a sure knowledge of just what is happening in any glad patch. Clear labeling which follows each lot or variety through planting, growing, harvesting, cleaning and storing the corms, and into the planting row the following year, makes it possible to *know* and not just jump to conclusions. This is too much to expect from the many who grow glads for casual enjoyment.

It should be realized, however, that while mutation, or true change (in color or character), is relatively rare, it is quite common to find a vigorously propagating variety dominate the scene after the lapse of a few seasons. There need not be any "change"—just survival of the fittest and the most prolific.

The above discussion has been based on performance at the corm level. Maintenance or increase of a desirable variety is relatively easy (and very rewarding) at the cormel level. The small, hard-shelled cormels or pips grow readily to blooming size corms in 2 or 3 years, and come true to the parent variety. Try saving and growing the pips from your favorite colored varieties —it's another way to have fun with glads.

If you are firmly convinced that you are blessed (or cursed) with the ability to whiten colored glads why not capitalize on same. The All American gladiolus group are offering a $1,000.00 reward for the first true white sport of the cream colored variety Landmark. Good hunting! Someone will come up with it.

House Plants as Christmas Gifts

AND THEIR CARE

by **J. BOUWMAN**
Head Gardener and Florist
Great-West Life Assurance Company, Winnipeg, Man.

House plants require thoughtful care and attention during all seasons if they are to fill their role successfully, and the accompanying notes will cover a few essentials for the proper maintenance of flowering plants and tropical foliage plants.

One of the most favored house plants of today is the Dieffenbachia, a handsome decorative propagated by cutting stems into sections with one or more eyes. Amoena has large, broad and pointed leaves, colored deep green with cream-white bands and blotches, and in my opinion is one of the best. Bausei has large, pointed leaves, yellowish green in color with dark green and white spots. These plants require a loose soil with at least half peat moss in the mixture. Overwatering is a common mistake, and it is best to keep them on the dry side rather than too wet, feeding not more than twice a year.

Philodendron is a tropical American foliage plant. The commonest is Philodendron Pertussin or split-leaf philodendron, one of the toughest house plants for the average home and mostly propagated by top cuttings. Overfeeding will cause brown blotches on the leaves or unattractive and ragged growth. Most philodendrons die from having been kept too wet.

Schefflera, a South American foliage plant, is well adapted to living-room conditions. The long, oval leaves make this plant very attractive and add an air of cheerfulness to many a spot. Avoid draughts and drying out; keep moderately moist and feed every two months.

While Ficus (Elastica) will do its best in a warm greenhouse with plenty of humidity, it also will stand a surprising amount of abuse. Here again water is the chief cause of failure. Brown spots, followed by yellowing and falling leaves, are an indication that the plant had been soaking wet too long, or that it had been allowed to become too dry and then was watered too freely.

The decorative plant which comes to you from the favorable conditions of the greenhouse, must readjust itself to home life and after a few weeks will become used to its new surroundings. With gradually reduced watering it can be maintained in good condition for a remarkably long time.

One of the most beautiful flowering plants during the winter and the spring is the Azalea, easy to maintain in the living room. The soil must be kept moist at all times, but cold water must never be used. The flowering period can be lengthened by nightly moving the plant to a room with a temperature of 60-65°F. Keep the soil well watered after blooming is over, in full light in a temperature of 50°F. If over large, transplant to a pot an inch greater in diameter, using straight peat moss and soaking well after re-potting. Pinch back any extra long shoots.

From June on, the pot should be sunk in the ground outdoors, with light shade and regular watering and spraying. A solution of a level teaspoon of ammonium sulphate in a gallon of water twice monthly will keep the soil acid. The plant must be brought indoors before frost. Experts can bloom azaleas by Christmastime, but the window gardener should not try it.

The Chrysanthemum in nature is a fall-flowering plant but potted ones in a great variety of color can be bought in florists' shops the year around. This has been brought about by long-day and short-day periods of culture simulating the long summer days and the short fall ones. Most potted chrysanthemums are not suited to garden growth; our seasons are too short and the plants fail to flower outdoors. In the living room, spraying daily with cool water will help to keep the foliage fresh and prevent it turning brown before the flowers fade. Keep chrysanthemums in a cool place and never allow the soil to dry out.

If your house is hot, Jerusalem Cherry will not survive. It is a poor house plant, liking a room temperature of about 50°F, with plenty of water, and a spot away from chills or draughts. Spraying the leaves daily may help.

Poinsettias are heat-loving plants, and if you cannot give them high humidity with a night temperature not much above or lower than 60°F the plant will chill and the leaves will drop. Normal living-room temperature is just fine; keep the soil well watered.

Keep the plant dry after blooming and stand in the basement. Cut half way well back in May and water; set in full light. In June, move the plant outdoors to a shady spot, and keep it well watered and fed. The plant is brought indoors in September, set in a sunny window and given plenty of water. Night temperatures should be 58-60°F, not lower or higher or the leaves will drop. Being a short-day plant, the poinsettia will not bloom if kept in a room where the lights are on several hours each evening.

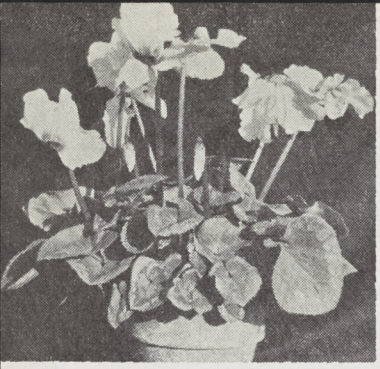
Be careful not to overwater Bromeliads. They flourish in humid air but do not like excessively wet roots. Most bromeliads collect water in the rosette of the leaves which form a tubular vaselike base, from which comes the name vase plant. Water may be applied to the rosette as well as to the soil but be sure to empty the rosette occasionally to allow it to dry out. Brown leaf tips or yellow, bleached foliage usually are a sign of too much water.

Saintpaulia, the African Violet, has swept into deserved popularity. The plants are easily grown; are ever-blooming and varied in blossom; do best in a north window, and through leaf exchange make excellent friendship plants. They will flower with less light than almost any other plant.

Probably next in popularity to the African violet is the Gloxinia. These favored plants offer large blooms and brilliant color tones and need no more light than the African violet. To maintain bloom in shapely plants, gloxinias should be watered from below with water that has been exposed for 24 hours to get rid of the chlorine in tap water.

Cinerarias are short-lived plants but will flower for weeks in the home if they are watered twice a day. The flowering plants that we receive at holidaytime need much more water and much stronger light than the average foliage plant to keep them in good condition.

A porous clay pot may be wrapped in tinfoil to retard quick loss of soil moisture in a dry room. Most house plants will benefit too if the night temperature can be brought below the day temperature.



The Cyclamens

by
FRANK J. DOWDING, F.R.H.S.
Florist
Saskatoon, Sask.

The Cyclamen, family *Primulaceae,* is a good, cheerful, winter-flowering plant, blooming from October until March under proper conditions, and at one time was the most popular winter house plant on the prairies.

Many people still love to have them but find difficulty in growing them successfully in the modern home heated by natural gas, oil, etc., because of the usually high temperature, both day and night, as compared with the old homes heated by coal (non-automatic) where the temperature varies and was low especially at night.

Cyclamens enjoy a cool moist atmosphere with a day temperature of 50 to 60°F. and during the night 45 to 50°. The answer is to find a cool spot. A north window away from a radiator is a good place. The plant should be set as close to the window as possible without touching the glass, turned around once a week and kept moist. Don't overwater but a frequent application of a very dilute fertilizer is recommended. Under these conditions your cyclamen should give you little trouble.

Leaf spot, a fungous disease, is easily controlled with a fungicide solution or dusting. Cyclamen mite also is easily controlled by mixing a solution of nicotine sulphate in water to which a little soft soap has been added, in a pail or a deep container. Next, holding the pot upside down, immerse the foliage for perhaps a half minute, (this does not harm the flowers if the plant is in bloom), shake gently, set plant in the sink to dry, and repeat in 10 days if necessary.

Cyclamen can be grown successfully from seed. The seed should be started in mid-August in a light compost of good soil and sand, pressing the seeds shallowly in the pot. The pot should then be covered with a pane of glass and kept shaded until germination. The seedlings are transferred into 2-inch pots and in the following mid-summer transferred again into 5- or 6-inch pots for the flowering period. The corms should be only half covered with soil.

Old plants can be grown on for several years; I have known good plants produced from corms up to 5 years. The flowers will be smaller but the plants will bear plenty of them. Along about the beginning of April, allow the plant to die down, watering less frequently. The corm is left in the pot to rest until early August, not allowing the soil to dry out completely.

The pot can be kept in a cool basement, or when there is no danger of frost the plant may be rested in a shaded spot, such as among plants or trees on the north side of the house. It is best to lay the pot on its side, occasionally splashing a little water on it. After resting, the corm should be removed from the pot and all decayed roots should be rubbed off. The corm is then re-potted in the same way as before, and the pot set in a cool, bright window.

There is a good range of colors in the variety of cyclamens which can be grown in the house, namely, pink, rose, purple, mauve, salmon, crimson and white. In my opinion, the growing of cyclamens is most rewarding.

The World of Tulips

by **W. H. GRAY, *Supervisor-Florist***
Assiniboine Park Conservatory, Winnipeg, Man.

Tulips are the most colorful of all the "spring-flowering" bulbs, and in our climate they can be grown very easily indoors and outdoors during the spring and early summer. The name "Tulipa or Tulip" is said to be derived from the Turkish word "tulbend," a turban, and refers to the shape of the flower. These plants belong in the Lily family, *Liliaceae*. They are natives of various parts of Europe, western Asia and northern Africa.

Doing a little more research, we find that Tulips have been grown and been popular for many, many years. Few flowers have caused such a sensation when first introduced as the Tulip. They were cultivated in Turkey before 1550, though for how long is not known. Busbecq, Ambassador of the Emperor Ferdinand I to the Sultan, mentioned in a letter written in 1554, seeing a garden near Constantinople with Tulips flowering in profusion.

The first record of Tulips flowering in Europe was made in 1559 by the famous German botanist Conrad Gesner. He reported seeing "a plant which sprang from a seed procured from Cappadocia. It was growing with a large, reddish flower, like a red lily, having 8 petals of which 4 are outside and just as many within, with a pleasant smell, soothing and delicate, which soon leaves it."

The exact date that Tulips were introduced into England is not known. But in 1582 it was reported that a man called Carolus Clusius brought into England, a few years before, plants from Vienna in Austria called *Tulipas*. These were procured a little earlier from Constantinople. Clusius or de l'Ecluse was the celebrated Belgium botanist who went to Leyden as Professor of Botany in 1593. Although the Tulip mania did not begin for another 30 years, de l'Ecluse made a small fortune by selling his bulbs.

We have no precise record of the earliest date of the introduction of Tulips into America but we are quite certain that the early colonists grew them around their homes. Certainly from 1640 onwards the Dutch settlers in New York (then New Amsterdam) grew Tulips. Adrian van der Donck, who visited New Amsterdam in 1642, later reported upon "the flowers in general which the Netherlands have introduced" and specifically included "different varieties of fine Tulips."

The Tulipomania, as it is commonly known, was a period of great interest and speculation in Tulip bulbs; this began in Holland around 1620 and 1623. Nickolas Wassenaer, writing in 1623, records that a variety called Semper Augustus had sold for thousands of florins, and that in 1625 the sum of three thousand florins was refused for two bulbs. By 1634 the Tulipomania was at its height. Clubs were formed and inns became Tulip exchanges. Great sums of money changed hands in the purchase and resale of bulbs. In 1637 the Tulipomania had subsided but in 1733 and 1734 there was a brief revival in the Low Countries. As late as 1836, the sum of 16,000 francs, a large sum in those days, was paid in Amsterdam by an amateur grower for a new variety, the Citadel of Antwerp.

The earliest mention of securing Tulips in flower before those in the open garden is to be found in Gervase Markham's "English Husbandman" (1615). He stated that Tulips and other spring-flowering plants, such as Narcissi and Columbines, were sometimes planted in boxes of earth placed on wheels, and that these boxes were left in the open during the daytime and were

wheeled under cover at night, so that they stood warm and safe from storms, winds, frosts, dews and other mischiefs which happen in the sun's absence.

The vast majority of Tulip bulbs planted in Canada and the United States are produced in the Netherlands. They are a very important part of the economy of the Netherlands and, therefore, the Dutch Government has set a high standard of quality for the growers of export bulbs to meet. The government sets also the price range and has agents constantly inspecting all bulbs to be exported. It is still wise for a person purchasing bulbs to inspect them carefully before buying and not just buy because they are in a colorful package. For best results, especially for indoor planting, top grade bulbs are the most suitable and give much more satisfaction.

There are really only two groups into which we classify Tulips — the Early-flowering and the May-flowering. The Early-flowering normally bloom in April, outdoors and the May-flowering in May. These groups are subdivided into 16 divisions, according to the character of flowers and the growth habit of plants. However, several of these divisions are not of much interest to us and some are not even listed in most catalogues. The ones most popular with us and briefly described below are:

Single Early Tulips: These grow about 9-16 inches in height, bloom in April, outdoors, look best when planted in groups, but may also be interplanted with other spring flowers. Good varieties are: DeWet, golden orange; Ibis, pink; Keizerskroon, red and yellow; Prince of Austria, orange-scarlet; Sunburst, golden yellow; White Hawk, white.

Double Early Tulips: Same habit as Single Early but flowers are double. The flowers usually last a little longer in good condition than those of the Singles. Good varieties are: Dante, blood red; Electra, carmine-pink; Marechal Niel, yellow and orange; Orange Nassau, orange-red; Schoonoord, white; Peach Blossom, rose-pink.

Mendel Tulips: These grow 16-26 inches tall, resemble Darwins but bloom two weeks earlier; some are double-flowered. Most varieties force well indoors. Good varieties are: Her Grace, pink and white; Athlete, pure white; Hildegarde, deep red.

Triumph Tulips: These grow tall, strong stems and large flowers of fine quality. They bloom between Early Single and Darwin Tulips. Most varieties grow well indoors. Good varieties are: Red Giant, bright red; Bruno Walter, golden brown with purple tinge; Bandoeng, mahogany red and yellow; Kansas, pure white; Princess Beatrix, orange scarlet edged gold.

Darwin Tulips: The most popular group; they are remarkable for their vigorous growth, long stems, sturdiness, and large flowers which are squarish rather than pointed in outline. Their colors are very brilliant and are excellent for outdoor or indoor plantings. Some of the new Hybrid varieties are really beautiful. Good varieties are: Golden Age, deep yellow; Bartigon, cochineal red; Demeter, violet-blue; Glacier, pure white; Princess Elizabeth, deep pink; William Pitt, strawberry red; Venus, silvery rose.

Rembrandt Tulips: These are usually Darwin Tulips that have "broken" (through a virus disease having caused a striping or variation in the color of the bloom). They are distinguished by having vari-colored flowers, beautifully striped, feathered or blotched, after the manner of those in old Dutch paintings. Good varieties are: American Flag, rose-red and white; Cordell Hull, white and rose-red; Madame de Pompadour, white and lilac.

Parrot Tulips: This variety blooms in May, is extremely showy but not too suitable for outdoor plantings unless in a very sheltered spot. The blooms are large, fringed with slashes of color; the stems are often weak, making them

more suitable for indoors. Good varieties are: Sunshine, golden; Orange Favorite, orange and green; Fantasy, pink and green; Black Parrot, maroon-black; Blue Parrot, lavender-mauve; Red Champion, red.

Late Double Tulips: These are sometimes catalogued as Peony-flowered Tulips. They flower in May. They are of sturdy growth and produce large, many-petalled flowers on long stems that last well. Some good varieties are: Eros, old rose; Livingstone, cherry pink; Uncle Tom, deep wine red; Mount Tacoma, white.

Botanical Tulips: Among this group are many beautiful kinds, suitable for planting in rock gardens or in locations where they may be left undisturbed. They also do well indoors. Usually they have several flowers on a stem. Two good varieties are: Praestans Fusilier, vermilion-orange, bunch-flowering; Turkestanica, white, orange, yellow centre, bunch-flowering.

Tulipa Fosterianna Hybrids: These grow 12-18 inches tall, have huge flowers in vivid scarlet and vermilion shades, and bloom in April. Good varities: Red Emperor, large, bright red blooms; Red Matador, vivid orange-red; Holland's Glory, enormous blooms of glowing orange-red.

Greigi Tulips: This group are fairly new and should prove very popular. The flowers are not very large but the leaves are mottled or variegated and very attractive. Red Riding Hood is very good, scarlet, base black and variegated leaves.

Outdoor Culture

The ordinary garden varieties of Tulips are most valued for massing in formal beds and borders, for planting in groups in perennial borders, also in window boxes or large planters. Some, such as the Botanical Tulips, are most useful for planting in rock gardens.

Although some varieties of Tulips will grow and flower regularly for many years, this is not generally the case in our climate. As a rule the bulbs gradually deteriorate and after a few seasons flower sparsely or not at all. For best results, and to assure uniformity in time of blooming, size of flower, and height of stems, new bulbs of good quality must be planted each fall. When doing this, the old bulbs need not be discarded after their first flowering. They should be allowed to ripen, be lifted and stored in a cool dry place and planted again in the fall in a less formal location or grown for cut flowers.

Tulips do best in a sunny location, but will stand a little longer if a little shade from the hot mid-day sun is provided. They do not like a shady location and cannot be expected to compete with the roots of trees.

Tulips thrive best in well drained, fertile, sandy loam; if the soil is very clayey or very sandy and is not modified by adding decayed organic matter, sand or heavier soil, it is not worthwhile keeping the bulbs of Early-flowering Tulips for a second year.

In preparing soil for Tulips, it should be dug deeply and fertilized moderately. As the roots grow downward from the bulb, it is more important to have good soil beneath the bulbs than above them. When preparing the ground, it is unwise to use animal manure unless it is thoroughly decayed, and then only if it is set about 8 inches below the surface. Bone meal is excellent for Tulips. It should be scattered on the surface of the ground at the rate of 3 ounces a square yard and dug in with a garden fork. An application of a complete garden fertilizer, such as one of 5-10-5 analysis, cultivated shallowly into the surface soil in the spring when the shoots are one to two inches high, is good for bulbs left in the ground more than one year.

Bulbs of Early-flowering Tulips should be planted in early October; May-flowering Tulips should be planted late in October or early in November. Early-flowering bulbs should be planted about 4 inches deep and about 5-6 inches apart if planted by themselves. If interplanted with other plants, they should be planted about 9 inches apart. Bulbs of May-flowering Tulips should be planted 5-6 inches deep and about 6-8 inches apart. If planted with other plants they should be 10-12 inches apart. They should be watered thoroughly after planting and then left.

After they have finished flowering, the plants should be allowed to dry or ripen, but if long periods of dry weather occur it is important to soak the ground thoroughly with water to keep it from drying out. Dry soil is likely to result in short stems, small flowers, and poor bulb development.

There are two distinct methods of caring for bulbs during the summer; one is to leave them in the ground undisturbed, and another is to lift the bulbs, store them in a cool place and replant next fall. The lifting and storage method is best, but great care should be taken in digging the bulbs so as not to cut or bruise them. They are dried by spreading in a shaded, dry, airy place for a day. The old roots and other debris are cleaned off and they can be dusted with DDT powder and stored in dry cool place.

Indoor Culture

To ensure success, it is necessary to obtain top-quality bulbs and to plant them early, September or October. Those that are to bloom first should be planted first and later varieties in succession. Single Early and Double Early are best varieties for indoors, although Mendels and Darwins also are good. The pots or containers to be used should be thoroughly cleaned of all previous soils. Good drainage, as with most plants, is very important. The soil should be a light, loamy, porous soil; old soil should never be used for bulbs.

Never use soil containing fresh manure. If your soil is very poor, it is considered safe to add a little bone meal or some phosphate to it. When planting the bulbs the soil should be really moist and cool. New pots or pans should never be used unless they are thoroughly soaked in water first. Set the bulbs so close together that they almost touch each other. The soil around them should be firm but not tight. The finished surface should be smooth and even, with the tips of the bulbs slightly buried or just peeping out of the soil. After planting, water thoroughly.

Tulips need about 8 weeks storage in a cool, moist, dark place, to stimulate root growth. Before they are brought up to the light and heat, the shoots from the top of the bulb should be 1-2 inches long, but more important, healthy white roots should fill the pots. When first brought into the light, the shoots should be shaded from strong sunlight until they become a normal green color. Watering should be light until the plants are rooted and then ample supplies of water are necessary; if the roots become dry the flowers will fail to develop and eventually will dry up. The application of diluted liquid fertilizer at weekly intervals is beneficial.

Single Early, Double Early and Mendel Tulips will flower in about four weeks, from the time they are brought into the light. Darwins do better if allowed about 8 weeks. All Tulips force more quickly later in the season, that is, as the time of their natural season of flowering outdoors is approached.

What does he plant who plants a tree?
He plants the friend of sun and sky;
He plants the flag of breezes free;
The shaft of beauty towering high.

—H. C. Bunner.

Transplanting Tomatoes with the Use of the Morden System

by **CHARLES WALKOF, Ph.D.**
Vegetable Specialist, Canada Experimental Farm, Morden, Man.

Vine-ripened tomatoes grown in the garden are a delight for most people. To be appreciated they should ripen as early as possible, preferably by August 1, and then be followed by a uniformly continuous succession of ripe fruit until the arrival of killing fall frosts. This is possible when adequate preparations are made for good plant development from the time the seed is sown until the crop is full grown on the plants.

Use of the right methods of growing tomato transplants is particularly important during the period from seeding until transplanting. One of the greatest mistakes often made by tomato plant growers is to provide home gardeners with plants that are large, overgrown, often leggy and in flower. In fact this kind of error is due to demands made by the home gardener who has the mistaken notion that large plants will provide the earliest tomatoes.

Tomato transplants that are tall and in flower may set a few fruits early, but they will be small and after they have ripened there will be no further fruit production for the next 2 or 3 weeks. As a rule, the development and ripening of second and third clusters of fruit may be delayed considerably on such plants. It has been observed, also, that the tall transplants have a restricted or small root system which fails to develop effectively after transplanting. Accordingly, the plants are not nourished adequately and the tomatoes they produce will be small and few in number.

While studying the growth and fruit production of tomato plants at the Canada Department of Agriculture Experimental Farm, Morden, Man., it was observed that small and young tomato plants were best for transplanting. They adjusted quickly after transplanting and produced a good root system. As a result of these observations, a method of transplanting tomatoes was developed which would give better plants in the garden and subsequently larger yields of ripe fruit than normally are obtained from the conventional method of transplanting. The new method was designated the Morden System.

The sequence of things to do when using the Morden System begins with planting the seed in a small box or convenient container on April 15. When the seed has germinated and the young plants have emerged from the soil it is important to water them only occasionally, probably once every 4 or 5 days. The soil should not be wet from frequent watering. Also, the plants should be kept in full light such as on a window sill and the best temperature is approximately 65°F. More than 70°F. is very undesirable. Cold air draughts and wind also are detrimental to the young seedlings.

The tomato plants are permitted to grow without disturbance for approximately 1 month in the box where the seed was sown. The only time they are taken out of the box is about May 15 when they are transplanted out-of-doors and to the location in the garden where they are to grow to maturity in summer.

A variation in this procedure is known as The Modified Morden System. This has been advantageous by producing still earlier-ripening fruit than the original method. With it, tomatoes have ripened in some years and on varieties such as Manitoba, by July 25 at the Morden Experimental Farm. The modi-

Left: Note the small plants being covered with a Hotkap. This was done on May 15 conforming to the Morden System of transplanting.

Right: A tent city in miniature arises as the Hotkaps are placed over the plants.

fication consists essentially of planting the seed on April 5, pricking out or transplanting the seedlings on April 20 into single containers such as jiffy pots or empty baby food tins, and then growing them until May 15 on a window sill in a temperature of 65 to 70°F., or in a glass or plastic sheet-covered, wooden frame that is heated with a 100-watt electric light bulb.

Whether the tomato transplants are grown by the Morden System or by any other method they are bound to be chilled by the cool outdoor air when transplanted on May 15. Therefore, they must be covered, as soon as possible, with plant protectors such as Hotkaps. It is good to pour a little liquid fertilizer around the base of the plants just before the Hotkaps are put on. At Morden, the transplanter fertilizer with an analysis of 10-52-17 has given excellent results. There are other formulations made up especially for transplanting which also are very effective. If cutworms are inclined to be bothersome, and they seem actually to appreciate feeding on plants under Hotkaps, the addition of some chemical, such as aldrin, to the fertilizer solution is a good deterrent.

It is surprising how much cold and frost a single Hotkap will keep out. In the event of a severe frost, say at temperatures of 20 or 22°F., it is helpful to place a second and a third Hotkap over the first. In 1963, the temperature was down to 18°F. on May 20 at Morden, 5 days after 3,000 tomato plants had been put outdoors under Hotkaps. The plants had double caps at the time. One morning, after a rain, the wet ground was frozen sufficiently to hold up a man and also little snow drifts had formed around the Hotkaps. When the plants were inspected 3 days later only one plant was found to be damaged. The remainder progressed well during the remainder of the season and produced ripe tomatoes beginning on July 20.

When the temperature rises to 75 and 80°F. it is important to ventilate the Hotkaps by cutting a hole, the size of a quarter, into the top of the Hotkap to permit any accumulation of hot air to escape. Despite cooler weather and lower temperatures which may occur thereafter, the ventilation aperture in the Hotkap can safely be left open without danger to the plant inside.

As soon as the plant grows so tall that it touches the paper it is necessary to open a larger hole about the size of a baseball. This permits the plant complete freedom for uniform development which is important to produce a good crop of tomatoes.

Removing the Hotkaps toward the end of June will provide a tidy appearance in the garden. However, the paper can be useful for controlling weed growth and reducing the evaporation of soil moisture. For this purpose

the Hotkaps are pressed flat on the ground around the plants. The best time to do this is when the weather has moderated and the danger of frost in June or the occurrence of cold, whipping winds is over early in the season.

During the 10 years that the Morden System has been used at the Experimental Farm, tomato plants generally have produced up to 10 and 12 pounds of fruit each and in years of favorable growing conditions as much as 15 pounds per plant were harvested. The higher yields were attributed in part to good root development and also to substantial branch growth initiated while the plants were covered with Hotkaps. A plant which is able to grow quickly to its full size early in the season will likewise produce and ripen its fruit quickly. This is why the plants grown by the Morden System have had ripe fruits before the end of July at Morden.

It is one of the best reasons why the method should be recommended for commercial production of tomatoes and particularly when tomatoes are grown in the home garden. Although Hotkaps are cumbersome to apply and require extra labor to place over the plants the benefits derived justify their use. It is not unusual to see them used to cover large numbers of plants in tomato fields grown during late winter in California and in other early crop producing areas.

The Swift Tomato

by **R. M. BLAKELY**

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The Swift tomato is a recently introduced home garden variety which has proved to have wide adaptability in many parts of Canada. It was developed at the Experimental Farm, Swift Current, Sask., the result of a cross between Farthest North and Bounty which produced F-25 which in turn was crossed with Redskin.

Swift was tested widely for several years under the number R-6-6 and has been found adaptable as a home garden variety in many sections of Ontario and the prairie provinces. It has been found to possess the ability to set fruit both above and below the normal range of temperatures for most varieties, an advantage in our cold springs and hot summers which are so common in the prairie area.

Swift is of determinate type with a spread of 36 inches. It is compact and sufficiently dense to provide moderate cover for the fruit. The fruit is a uniform pale green when immature but uniformly red when mature. The variety was selected specifically to be free from concentric cracking and green overwash at the stem end and the result is that it ripens uniformly. In shape it is globular when mature although somewhat inclined to have a greater polar diameter when immature. The flesh is bright red and the locules are thick walled, giving it a "meaty" appearance. The quality is good being mildly subacid. It is somewhat soft for commercial processing but is excellent for the home garden or basket trade. Swift generally is 3 to 5 days earlier than Early Chatham and 5 to 7 days earlier than Meteor. In the production of ripe fruit it commonly outyields all other varieties in the same maturity group.

One other aspect of this variety is that it appears to be particularly adapted to the heavy clay areas such as the Regina and Sceptre heavy clay loams in Saskatchewan. Foundation stock seed will be maintained at the Experimental Farm, Swift Current, Sask. It is available also in limited quantities commercially from Lowden's Plants and Seeds, Ancaster, Ont.

Tomato Production and Its Reward

by **T. A. SANDERCOCK, Vegetable Specialist**
Manitoba Department of Agriculture and Conservation

Success in growing tomatoes comes with careful planning and timeliness in the application of cultural practices. The early selection of seed, the determination of a date for indoor seeding, the hardening off of plants for outdoor planting, the application of fungicides and insecticides and the application of supplementary water, are all aspects of production that require careful consideration to ensure a bountiful supply of ripe tomatoes.

Variety valiant

The choice of variety or varieties to grow is generally the first consideration. Should it be of the bush type or the staking type? There are advantages and disadvantages to both types. The bush type takes much less care as the staking and pruning operations are not required, while on the other hand the staking varieties take much less space in the garden and their fruit is held well off the ground resulting in reduced blemishes on the fruit. This is especially true under excessive moisture conditions. The selection of the fruit as it ripens is also much easier when the plant is held well off the ground. As far as earliness and yield are concerned there is very little to choose between the two types. The varieties of each type recommended in Manitoba are as follows:

Staking — early — Valiant
late — Moreton Hybrid
— Queens

Bush — early — Mustang
late — Manitoba
— Bush Beefsteak

Once the type of tomato and the variety to be grown has been decided, the date of seeding indoors becomes the next consideration. Too early seeding rather than too late has been the cause of many disappointments in growing tomatoes. The task at hand is to produce a seedling that will transplant to the field with as little shock as possible and will reduce to a minimum the time necessary to produce fruit once it is set in the garden. The date of indoor seeding will depend to a large extent on when the plants are to be transplanted to the field. There are two practices used at the present time.

1. Seeding indoors and planting the seedlings outdoors when the possibilities of frost occurring are over, or
2. Seeding indoors and planting the seedlings outdoors under hot caps as soon as growing conditions are satisfactory but the possibilities of frost occurring have not yet passed (Morden system).

If we choose the first method it takes about 7 weeks to produce a satisfactory plant. With this in mind seeding indoors should take place about the 1st of April for planting the last week in May. If the second method is used best results have been obtained with seedlings which are about 4 weeks old when planted to the field. Thus with field plantings taking place between May 15th and 20th seeding should be undertaken indoors around April 15th.

Growing Transplants

The production of healthy seedlings is the next consideration. The seeds may be germinated in either sand or vermiculite and when the small seedlings have reached the first true-leaf stage they should be transplanted out into flats containing a suitable soil mixture. The seedlings should be spaced about 3″ apart in the flats. In many cases home gardeners prick the plants off into small "jiffy" pots (3½″ diameter) where each plant is grown individually. This system is excellent as it prevents damage from occurring to the roots when the plants are placed in the garden. In any case seedlings should not be pricked-off more than once while indoors.

Temperature: Tomatoes germinate best at soil temperatures between 65° and 75° and slow down at 50°F. Below this temperature germination decreases very rapidly. Once germination has taken place growing temperatures of 65 to 70°F are most satisfactory. On cloudy days temperatures should be reduced to about 60°F.

Watering: Care should be taken not to over-water tomato seedlings. This is especially true during dull cloudy days when light conditions are poor. Many commercial growers hesitate to water at all if they expect continued cloudy weather conditions. It is during periods of this nature that damping-off of the small seedlings is most likely to occur.

Light: Tomato seedlings should be grown under full light conditions. If light intensities are low and temperatures remain at a fairly high degree a tall leggy plant will be the result. If light intensities tend to be low then temperatures should be lowered somewhat to compensate for this deficiency.

Hardening Off: Plants grown indoors are quite tender and must be conditioned for outside conditions. The most successful way to harden off the plants in preparation for planting to the garden is by reducing the moisture supply. This slows down the plant's growth and allows it time to store up energy which can be used once it is placed in the field. Care should be taken not to slow down growth to too great a degree as it tends to stunt the plant and a much longer time will be necessary to bring it back into full growth after transplanting.

Location of Crop in the Garden

Tomatoes are a warm season crop and produce best under average daily temperatures of 70 to 75°F. Temperatures higher or lower than this adversely affect the tomato crop. Plants may be barren if night temperatures fall below 55°F for several hours or day temperature rises to 100°F. Considering these facts it is important to locate the tomato plants in an area of the garden which allows for sufficient protection from strong cool winds but also provides adequate air circulation when daily temperatures are extremely high in the summer months.

Fertilizer

The value of chemical fertilizer has not been determined for tomato production under Manitoba conditions. However, an application of a high phosphate fertilizer at planting time will encourage rapid root development and reduce the shock of transplanting.

Moisture Requirements

The moisture requirements of tomatoes are more demanding during the earlier part of the growing season. This is no doubt due to the fact that tomatoes are a deep rooted crop penetrating the soil to depths of 3 to 4 feet within two months. Experiments carried out at the University of Manitoba indicate that the heaviest demands on moisture are during the third and fourth

week of July when the fruits are developing at a rapid rate. After the middle of August very little moisture is used by the plant. Thus the most important time to add supplementary water would be at transplanting and then during the latter part of July.

Pruning

If the bush type tomatoes are grown, pruning will not be required. However, if the staking variety is the choice of the home gardener, then pruning should be carried out several times during the growing season to obtain the most rewarding results. The general practice is to prune the plants to one main stem. To accomplish this it is necessary to remove the side shoots that arise from the axil of each leaf as it develops (as illustrated in the picture). Do not remove any leaves as they are needed to manufacture the essential materials for fruit development. The growing tip can be removed after 4 or 5 trusses of fruit have been formed. The benefit of this practice is questionable.

Pruning staking tomatoes

Blossom-end Rot

Lack of moisture has been stated as the major cause of blossom-end rot. This is no doubt true but it has also been found that tomatoes will develop this condition under satisfactory moisture conditions. It is indicated that during extremely hot periods the plant loses moisture faster than the roots can absorb it from the soils. If this happens during the time that the fruit is in a rapid stage of development blossom-end rot will occur.

To prevent blossom-end rot ensure that the plants have some protection from hot dry winds which so often occur during July when the plants are producing lush growth. Also refrain from planting tomatoes in extremely hot areas of the garden such as on the south side of fences where there is little or no air circulation.

Insect and Disease Control

Insects and disease may cause considerable damage to tomato plants if not regularly attended to. Insects have not been a serious problem in growing tomatoes except at certain times when aphids and leafhoppers infest the crop. Regular applications of malathion every two weeks is generally sufficient to keep the plants fairly free of damage.

Diseases on the other hand have caused extreme damage which in some cases has caused complete destruction of the crop. Leaf diseases such as Early Blight and Late Blight are the most serious and regular offenders. Regular applications of a fungicide (Maneb or parzate) every 10 days to two weeks will keep down infection and prevent the spread from one plant to another. If conditions are extremely moist the application of fungicide should be much oftener. It is also good practice not to work in the tomato crop while the dew is still on the plants. Early Blight may appear early in the season so the spray program should be started shortly after the plants are set in the garden.

Physiological Leaf Roll

This is a condition that occurs quite often just prior to the ripening of the first fruits. It is more common on staking varieties than on the bush types. The symptoms of this condition show up in the thickening of the lower leaves accompanied by a tendency to roll inwards. The leaves also become very brittle and damage easily. As far as is known this condition has little or no effect on the quality or the yield of the crop.

Ripening Tomatoes Indoors

Every year with the first frost warning large volumes of green tomatoes are picked and moved indoors for further ripening. In doing so it is possible to have home grown tomatoes for the table well into the fall months. However, many reports are received from people who have trouble in getting the fruits to ripen properly.

The artificial ripening of tomatoes is a very exacting process. The fruits ripen best at temperatures between 65 and 70°F with a high relative humidity to prevent excessive shrinkage. Ripening will occur at temperatures as low as 50°F but a much longer period of time is required. There is a slight adverse effect on flavor at this temperature. At temperatures of 80 or 85°F tomatoes ripen more rapidly but fail to develop natural color. They tend to take on a yellowish orange shade and are soft in texture and lack flavor.

Indoor ripening of tomatoes

If tomatoes are subjected to temperatures below 50°F for any length of time proper ripening will not take place even though the fruits are restored to ideal ripening temperature. This will account in many cases for the difficulty that the home gardener encounters when trying to ripen his late fall harvest of green tomatoes. Quite often daily temperatures fall below 50°F during the last couple of weeks before the first fall frost, thus chilling the fruit sufficiently so that no matter how it is handled later satisfactory ripening will not occur. Therefore, as a recommendation to the home gardener who wants to extend his tomato crop through indoor ripening of the fruit I would suggest that he harvest before chilling occurs in the field and harvest only fruit which has developed a bright waxy green appearance. The fruit, once it has been picked, should be placed in a room at a temperature between 65 and 70°F. To prolong the ripening process the temperature may be dropped to as low as 55°F. If it is desirous to preserve the tomatoes for even a longer period place them in the refrigerator after they have reached the firm ripe stage.

Harvesting and Storage of Potatoes

by **D. H. DABBS, Assistant Professor of Horticulture**
University of Saskatchewan, Saskatoon, Sask.

The harvesting of potatoes for immediate use may begin as soon as the tubers are sufficiently large. However, if the tops have not been dead sufficiently long for the skins to be thoroughly set, a good deal of care must be taken to prevent injury to the tubers. It is best to wait until the end of September to harvest the main crop intended for storage. At this time, the tubers normally are mature in most varieties.

Chemical top-killers are widely used by commercial growers and could well be used by home gardeners in years when fall frosts do not kill the tops early in September. A number of different chemicals can be used, and perhaps the most widely used is sodium arsenite. Dilute the material with water as recommended by the manufacturer for a slow kill. The tops should be sprayed 10 days to 2 weeks prior to harvest. This slow top-kill will encourage the tubers to mature and "set" their skins without the danger of encountering internal disorders which sometimes occur from a rapid top-kill.

Whether the potato crop is dug by hand, by a potato digger, or by a plough, care should be exercised to prevent undue injury. The harvested tubers should be left on the ground only long enough to dry on the surface. Some varieties will show sun-burning very quickly, and some will build up objectionable levels of the bitter alkaloid solanine when exposed to strong light.

Potatoes should not go directly from the garden to cold winter storage quarters. Many instances of severe storage losses are due to rots which have been traced to this practice. Rather, they should be given a 2- or 3-week storage period at relatively warm temperatures before being placed in cold storage. This treatment allows for a rapid healing of small cuts and bruises and thoroughly "sets" the skin. It also encourages a rapid decay of those tubers that would later rot in storage regardless of any treatment given to them. A final careful sorting before the potatoes are moved to their winter quarters assures that only sound, healthy tubers are thus stored.

This warm storage treatment may be given in a completely dark building or, if this is not available, they may be pitted for 2 or 3 weeks outdoors. A shallow round pit should be dug and the potatoes piled within it in a conical pile. This pile should be covered with burlap or old cloth of some sort. Then a liberal layer of dry straw or any dry litter should be placed over this. A layer of soil may be placed over the litter to prevent it from blowing away and also to shed any fall rains that may occur.

During the interval in which the tubers are being kept in relatively warm storage, the temperature of the winter storage quarter should be allowed to drop as close to 40°F. as possible. This storage quarter may be a farm root cellar or more often than not is an insulated basement storage room. The temperature can be dropped rather quickly by opening the vents on cold evenings and closing them the following morning. Ideal winter storage temperatures for potatoes are no lower than 36°F. and no higher than 40°F. The relative humidity should be high and ventilation should be adequate. Potatoes should be piled in slatted boxes, bins or shelves, and do not need to be covered if the relative humidity is fairly high.

If storage temperatures drop to between 36°F. and 32°F., some of the starches are converted to sugars and an objectionably sweet tuber results. As

well as the build-up of sugars, internal brown fleck and/or dark gray or even black areas will develop. Likewise, potatoes stored without adequate ventilation, regardless of temperature, may develop internal flesh darkening or even the break-down of the flesh. If storage temperatures remain much above 40°F. for any great period, premature sprouting and shrivelling of the tubers will occur.

If past experiences show that it is difficult to keep the winter storage temperature sufficiently low (between 36°F. and 40°F.), the potato crop may be treated with a sprout inhibitor prior to harvest. The inhibitor that we will consider here is Maleic Hybrazide which is often sold as MH-30. The potato tops should be sprayed at 2 to 3 weeks after full bloom (or 1 week after the blossoms drop). The concentration of the MH-30 should be 3 fluid ounces in 2½ to 3 gallons of water. This should be sprayed on 1,000 square feet of potato tops. *Do not use MH-30 on potatoes that you wish to use for seed.*

The use of such a sprout inhibitor will greatly retard sprouting in relatively warm storage areas. However, sprout inhibitors really should be used only in conjunction with good storage conditions and not as a substitute for these conditions.

Potatoes should be periodically sorted during the winter in order that any decaying tubers may be discarded before large areas of the bin become involved.

If an electric light is used in the potato storage room, the switch should be on the outer wall and should be provided with a red pilot bulb. In this manner, it is unlikely that the light will accidentally be left on and thus greening of the stored tubers will be prevented.

Some Thoughts on Starting Early Vegetable Crops

by **H. T. ALLEN**
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Lacombe, Alta.

Most gardeners at one time or another are confronted with disease and other problems while starting plants indoors for planting in the field when weather permits. Early indoor seeding of the long-season vegetable crops usually does not present the problems that often are encountered with many of the smaller-seeded annual flowers.

Seed packets too generally have sufficient seeds so that some losses through disease or accidental mishandling can be tolerated without seriously affecting the quantities of plants required. Many gardeners resort to soil sterilization or chemical treatments to prevent losses through disease, and many have special locations for starting plants and thus minimize the chance of losses due to temperature fluctuations, inadequate lighting, etc.

One convenient medium in which to start seeds is the form of mica known as vermiculite. By using material such as this the gardener does not have to concern himself with preparing soil mixes in the fall or storing such mixes, or with the ingredients for making up the seeding medium later in the winter. Nor does he have to resort to sterilization or chemical treatments to assure disease control.

In vermiculite, seedlings will develop excellent root systems, will grow adequately to the pricking out stage, and are easily removed from the medium

with little root loss. It must be realized, however, that there are several forms of this material on the market. Some have poor water retention properties, others are too coarse and still others are harmful to seedling development. A grade of vermiculite recommended for horticultural purposes should be used to avoid these problems.

Small wooden flats or shallow containers with bottom drainage are adequate for starting seeds. The container should be filled level with vermiculite and set in a pan of water until the whole surface becomes damp. The container should then be removed, allowed to drain for a few minutes and the medium packed to a level desirable for seeding.

Seed can be either broadcast or sown in shallow trenches, covered with dry vermiculite and pressed to firm the material about the seed. Light watering to wet the new material is desirable but care must be taken to avoid overwatering, as because of its lightness the vermiculite may float and disturb the location of the seed, especially when more than one variety is seeded in the same container. The thickness of vermiculite over the seed does not need to be more than one-eighth to one-quarter inch. For very small seeds a fine sieve is a convenient tool to use to cover the seed.

Covering the container with a sheet of glass will ensure adequate moisture until germination. If the containers are placed where direct sun may strike a sheet of newspaper over the glass for shading will prevent over-heating. As soon as germination starts the coverings should be removed and bottom watering resorted to when necessary. The seedlings should be pricked out into soil-filled containers as soon as the first true leaves are formed; leaving seedlings in the vermiculite longer will cause a setback.

A similar method that works well is to partially fill the container with a good soil mix with about a half-inch layer of vermiculite on top in which the seed is sown. As the roots develop they will of course grow into the soil and seedlings can be left for a longer period in the seed flat. Pricking out is not as easy in this case as it is with straight vermiculite.

With certain vegetable crops such as cucumbers, musk or watermelons, it is best to use one container from seeding to field planting, except of course where field seeding is satisfactory for these crops. There are many containers on the market suitable for this purpose and either one which allows roots to grow through the walls or one from which the bottom can be removed at time of field planting is satisfactory. In these cases a soil mix must be used.

Three or 4 seeds pressed into the soil usually will assure at least one plant per container and if more than one germinates they should be thinned to one plant. Time of seeding is important in these cases as it is better to have small, stocky plants rather than tall, spindly ones for field planting. Also, if plants grow too long in the container roots will grow beyond the walls or through the drainage holes and there will be some root disturbance at planting time.

Much has been written regarding the use of plant protectors and plastic mulches as aids for improving earliness and yields of certain crops, particularly the cucurbits previously mentioned. In short-growing season areas, such as the Park Belt of central Alberta, a combination of single-plant container and plastic mulch has been a most reliable cultural practice for these crops.

Results with solanaceous vegetables including peppers and tomatoes have not been conclusive. Recent tests, however, indicate that the Morden method of growing tomatoes holds promise. This involves the use of a single-plant container, protective tents, starter solution and early planting, approximately 20 days prior to the average last spring frost.

Battleford tree in blossom

Heyer 20 apples

Fruit Growing in a Prairie Orchard

by **KENNETH N. HEAVER**
Heaver Orchards, Baljennie, Sask.

The Heyer 12 is still a very good apple for the prairie home garden because it is hardy and of good quality for sauce, pies, canning, eating out of hand, and freezing. On the other hand, its short season and the readiness of the fruit to fall off the tree incline me to prefer Heyer 20, a strong, hardy tree with a tendency to be a biennial bearer. The apples are larger and keep better; they are excellent for freezing and hang on the tree well.

Battleford is still my favorite, since it bears a nice crop of standard size apples of consistently good quality. Reward does very well here and with its annual crop of large, good quality fruit is hard to beat. Duchess is a small tree with medium size, showy fruit; Simbrisk is another with showy, medium size fruit; Erickson is our largest cooking and eating apple, and bears well every year.

Hibernal is a fairly hardy tree, producing cooking apples. Goodland looks good. Blushed Calville is a good, early season apple and quite large. Wealthy, a British Columbia commercial variety, is a 12-foot high tree and still fruiting reasonably well after 20 years growth, but its apples do not size up as well as most of the other varieties that I have mentioned, as it requires more moisture. We have several other varieties doing equally well.

In addition to the varieties mentioned, we have a large number of standard apple varieties on test. Growing new varieties is a most interesting hobby.

Rescue still is our top crabapple, bearing a heavy annual crop of fine fruit excellent for both preserving and freezing. The children love eating them. Renown is hardy and productive of fruit that is sweet eaten out of hand but disappointing when canned. Trail is not too hardy but we have found that it thrives much better under moist conditions. Its fruit is good quality. Kerr is doing well and just starting to fruit. Dolgo is still a top jelly crab and a good ornamental tree.

Red Heaver, our own Rosybloom introduction, is a medium size, dual purpose ornamental tree with deep pink blossoms followed by pretty red and purple fruit 1¼ inch size. They are good for jelly and according to University of Saskatchewan tests are good also for pickling. Printosh, Marilyn and Jesim are fairly good late season crabapples and quite hardy.

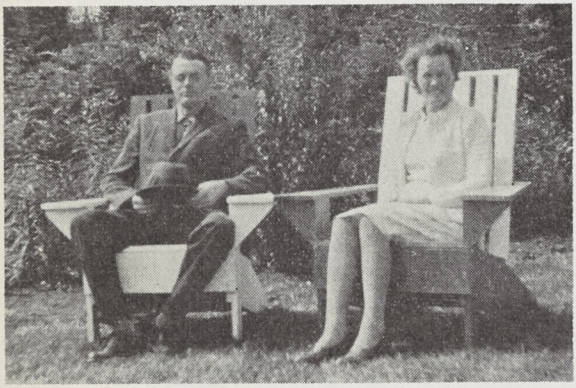
Plums Bounty and Dandy, two native varieties, are good, fairly hardy and quite early. The hybrid Pembina bears well here about every other year. The fruit is large but not too good in quality when preserved. Tecumseh does fairly well, producing medium size fruit of fair quality. Grenville, our best plum, is not too hardy but fruits well every second or third year.

In the Sandcherry-Plum hybrids, Heaver, our own introduction, is a hardy, low-growing shrub fruiting early, that should be good for northern districts. The good-sized fruit is red with green flesh and a small pit, hangs on well to the bush, and any left unpicked usually will dry like prunes. Manor, a Morden Experimental Farm introduction, is very good; and Opata is good and hardy.

After trying for 20 years, we finally raised our first apricots which I must say I was quite proud of. We had a very dry growing season but the fruit measured up to 1½ inches in diameter and compared quite favorably in quality with imported varieties. The apricots were good eaten out of hand and very freestone. They are very good canned, when pitted. The fruit came from a seedling row, spaced 4 feet apart, the seedlings sent to me by a very kind friend. I planted them on heavy land so that they would bloom later to help miss the frost. A plate of these apricots displayed at the Saskatchewan Provincial Fruit, Honey and Horticultural Show in Swift Current took first prize in competition with named varieties.

We have a few of the new pear varieties introduced by the University of Saskatchewan but will have to wait a few years before they fruit.

We now have 15 acres of orchard, and hundreds of people come from far and near to see and to pick apples just as large as any brought in from British Columbia or Ontario. We are continually replacing the old, inferior varieties with new, improved varieties as they prove hardy and superior in quality.



In conclusion, a word of advice to those planting their first fruit trees: Unless you have very good shelter, start with some of the older, hardier varieties and plant at least 25 feet from shelterbelt.

Mr. and Mrs. Kenneth Heaver

An orchard site with good air drainage

Orchard Sites

by **D. R. ROBINSON**
Extension Horticulturist
University of Saskatchewan
Saskatoon

During the past fifty years various governmental institutions and private individuals have devoted considerable time and energy to the development of hardy fruits for the prairie provinces. Accordingly it might be worthwhile, at this time, to take a quick look at the subject of "orchard sites" and certain factors related thereto.

Almost without exception the orchard will be located, for convenience, close to the farm home and, of course, an adequate shelterbelt on the south, west and north sides of the orchard is a virtual necessity. Some shelter on the northeast may also be desirable. In many instances the orchard will, of course, be located on level land. It is worth noting, however, that an orchard site with a gradual slope to the east, northeast or north offers certain advantages. Here the snow will remain for a few days longer, thus delaying the date of blossoming; and the loss of soil moisture, caused by westerly winds, will be somewhat reduced.

A study of local topography, supported by occasional observations, indicates the possibility of "favorable orchard sites" being located in a number of communities in the prairie provinces. This idea is directly associated with the phenomenon of air drainage and temperature which provides, under suitable conditions, a local climate more favorable than that of the surrounding area. Briefly, where you have a moderately uniform slope, preferably toward the east, there is a marked tendency for cold air to collect at the base of the slope and warm air to move upward toward the top of the slope. In this connection certain temperature records obtained at the Dominion Experimental Station, Beaverlodge, Alberta*, may be of interest. The records quoted below are for an 11-year period, 1932 to 1942 inclusive. Daily temperature readings were taken on an eastward slope which extended a distance of 214 rods (roughly ⅔ mile). The relatively gradual rise from the base (at the edge of a slough) to the hilltop was 134 feet. During the eleven years, mentioned above, the average frost-free period at the slough edge was only 32 days while the average frost-free period at the hilltop was 106 days. Further, the longest frost-free period at the slough was 76 days (in 1941) and the longest frost-free period at the hilltop was 129 days (in 1940).

The advantages of an orchard site with a longer than average frost-free period are largely self-evident. The danger of frost damage at blossoming

*Albright, W. D. and J. G. Stoker. Topography and Minimum Temperatures, Sci. Agr. 25: 146-155. 1944.

time would be considerably reduced. Likewise, varieties which require a somewhat longer than average period of ripening could be grown. It would, of course, be impracticable to plant fruit trees (or other garden crops) on a steep slope. A gradual easterly slope with a level area or shelf about midway along it would be an almost ideal location (see illustration). While an easterly slope has been mentioned it is probable that a slope to the northeast or southeast would be almost, if not quite, as suitable.

In considering the matter of air drainage as it relates to orchard sites there are several variations of the above-mentioned proposal that could be considered. One orchard that we have visited in southwestern Saskatchewan is located on a plateau with a steep slope to the southeast. In a location of this kind, on a tableland, the warm air moving up the slope will tend to spread out and the moderating effect will be less marked here than on a shelf part way down the slope. There is air drainage to the base of the slope, however; and the orchard in question is protected by a good shelterbelt on the west and north. Some 30 years ago a successful orchard was established by the late Frank Randall of Leacross. This orchard was planted on a large flat-topped hill with air drainage in all directions. The fruitfulness of the Ken Heaver orchard, near Baljennie, can in part, be attributed to the influence of air drainage provided by a large ravine. Other examples could be mentioned.

It seems probable that the advantages of orchard sites with air drainage have not been widely recognized. At least some locations, large enough for a few fruit trees, are within reasonable distance of the farmstead. In Saskatchewan the banks of several rivers, with numerous ravines and gullies opening thereon, undoubtedly include favorable orchard sites. The sloping banks of old glacial drainage channels contain suitable locations with air drainage. Rolling, hilly country adjacent to lakes and sloughs offers possibilities. Keeping in mind the general topography of this province, it seems likely that favorable orchard sites will be found more commonly in the park belt than in the open country to the south and west. While we are not well acquainted with the general topography of Manitoba and Alberta, no doubt orchard sites, of the type described above, also occur in these provinces.

Winter Protection in the Prairie Orchard

by **H. A. QUAMME**

Research Officer, Fruit Crops, Exeprimental Farm, Morden, Man.

Much progress has been made in developing hardy varieties of fruit but there is still much to be done from the standpoint of hardiness. Thus for the prairie fruit grower protection against winter injury is of paramount importance.

Although the exact nature of frost resistance is not fully understood, it is known that certain closely associated conditions are of practical importance to the fruit grower. Early maturity of the plant or "hardening off" is one of these. Plants not properly hardened off are especially susceptible to sudden drops in temperature. This is more of a problem in areas having high rainfall and long growing season than those having dry, short seasons. The drying action of prairie winds is another factor influencing winter injury. In spite of the great water retaining capacity of dormant plant tissues, they will not withstand an indefinite amount of desiccation. Winter injury is also associated

with premature breaking of winter dormancy during mild spells followed by sudden drops in temperature. This problem is acute in south and western Alberta where growing temperatures may be brought about during the winter by chinook winds. The general vigor and health of the plant influences the susceptibility and ability to recover from winter injury. A plant that is unthrifty and has low food reserves succumbs more readily than one that is in good condition.

Winter protection should start when the site for planting is selected. The importance of shelter cannot be over emphasized. It may be possible to take advantage of the natural protection of hills or valleys but a good shelter-belt of native or planted trees is essential. Drainage is also important. Most fruit crops do not grow well on poorly drained soils. Iron induced chlorosis contributes to the lack of hardiness and it is imperative that the soil have a history free from chlorosis.

Drought and winter injury work hand in hand to bring about the death of the plant. Irrigation just before freeze-up after the plant has become dormant is desirable to prevent injury by wind desiccation.

To prepare plants for winter the fruit grower must encourage early maturity of the wood and plant tissues. Avoid irrigation in the late summer and fall and apply nitrogen fertilizers only in the spring. Cover crops and sod are useful in reducing available moisture and nutrients to hasten maturity.

In addition to these general considerations each fruit crop has special requirements for winter protection.

Tree Fruits—Some measure of protection can be achieved by white-washing or shading the southwest side of the tree with boards or burlap to prevent sunscald. The importance of using hardy rootstocks must be emphasized. Most fruit varieties are usually propagated on hardy seedling rootstocks and for this reason purchase trees from reliable prairie nurseries.

Head prairie fruit trees low and in areas where severe killing frequently occurs train them to a bush-like habit. Remove all injured wood to prevent the entrance of decay causing organisms and to encourage new growth.

Tender varieties may be top-worked on hardy stem pieces to produce trees more resistant to crotch and trunk injury.

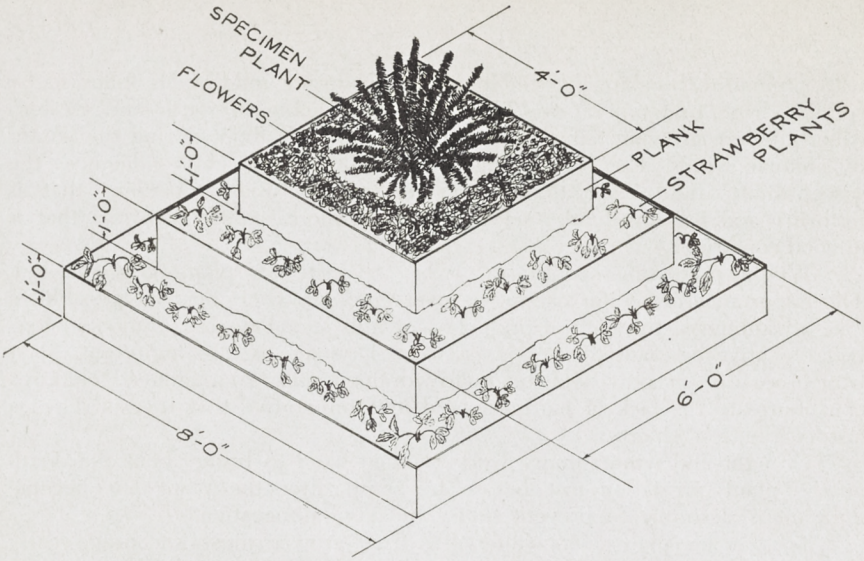
Small Fruits—Direct protection of small fruits is both feasible and practical. Straw or hay mulches are recommended and in many cases necessary for profitable crops of strawberries. A 3 to 4 inch mulch is applied in the fall after the first heavy frosts and removed in the spring after the threat of frost has past.

Raspberries may be left standing but where severe winter killing of the canes is a problem the canes may be bent over and the tips covered with soil.

In preparing grapes for the winter, it is necessary to cut them down from their supports and cover them with earth. Most varieties will not survive without this cover.

Gooseberries and currants will survive uncovered if they are in a thrifty condition.

A little care taken in protecting plants from the winter often means success in obtaining a crop, making fruit growing both pleasurable and profitable.



The Strawberry Pyramid . . . *Beauty and Utility*

by **P. J. PETERS**
Horticulturist, Fruit Crops
Manitoba Department of Agriculture and Conservation

Is your strawberry patch a sore spot in your garden and a poorly yielding investment to boot? Why not change this! Build a strawberry pyramid that will transform a sore spot into the beauty highlight of your flower garden. Combine beauty with utility – and delight.

Build a 7-foot by 7-foot frame of 10-inch planks. Keep the planks from warping by nailing tin strips around the corners. Set this square in a central location of your flower garden and fill it with soil. Three parts of soil and one part of old manure is a good mixture. Pack the soil down well.

Build a second frame, 5 feet by 5 feet, also of 10-inch planks. Set this on top and in the centre of the filled 7-foot by 7-foot frame. Fill with soil mixture and pack well. Build a third frame 3 feet by 3 feet, also of 10-inch planking. Set on top and in centre of the second frame. Fill with the soil mixture and pack.

Buy good healthy everbearing strawberry plants. Get 1½ dozen Gem, 1½ dozen Ogallala and 2 dozen Red Rich. Plant 2 sides of the lower border with Gem and 2 sides with Ogallala, about 7 plants to a side. Plant all sides of the second border with Red Rich, 5 to a side. You will have 4 plants of each variety left over which you will plant in the garden for spares. The upper frame becomes your flower garden. Use central, tallish specimen plants such as geraniums. Plant a border of petunias around the geraniums.

When everything has been planted use a white paint (or your own favorite color) to paint your pyramid frame.

How do you care for your pyramid? Water every week. Spread a mulch of straw, lawn cuttings or plastic around your strawberry plants. Cut off all the buds in spring as soon as you see them; this will help the strawberries to establish themselves and the late summer buds will be more numerous and

stronger. As soon as the plants begin to develop runners, cut these off. Keep on cutting off all runners at all times and you will thus develop strong mother plants capable of giving you larger fruits and more of them. Your late summer crop should be a source of culinary delight and visual beauty.

You can make this crop last late into fall too. When the first fall frosts come, throw an old blanket over each side of the pyramid to save your flowers and buds. You will occasionally eat fresh strawberries even in November.

When the winter winds begin to blow and the thermometer dips to about 15°F, cover up the border of your pyramid with at least 4 inches of straw. Tack a polyethelene sheet to the upper and lower frame to keep the straw from blowing off. Then retire to your dining table and have a dessert of the lovely strawberries you preserved in September.

In early May when the young man's fancy turns to love, yours must turn to your pyramid. Uncover your pyramid and remove the mulch and winter cover. Plant the top of your pyramid with flowers. Spray the strawberry plants with kelthane wettable powder at the rate of 2 teaspoons per gallon of water to control cyclamen mites. As soon as the first blossom opens, spray with DDT, 2 teaspoons wettable powder per gallon of water, to control tarnished plant bugs and thus prevent cat-face berries.

Again cut off all runners in summer. Mulch between plants to keep the roots cool and moist. Late in the fall after the crop is over, pull out all strawberry plants and burn them. Dig up the soil in the borders. Buy and plant new plants in spring.

This pyramid can be built larger or smaller. Use 8 feet by 8 feet, 6 feet by 6 feet and 4 feet by 4 feet squares for a larger one. A smaller one could have 5 feet by 5 feet, 3 feet by 3 feet and 1 foot by 1 foot squares. A pyramid strawberry bed lends itself easily to protection from birds; it is easy to build screen frames to lean against the sides of the pyramid.

This is your strawberry pyramid. It can be a focal point of beauty in your garden and can repay you with better fruit than you ever ate. All depends on the love and care you devote to it.

METALDEHYDE, used as poison bait for slugs, is (C2H40)4, a polymer (condensation product) of acetaldehyde, an alcohol derivative.

Boulevard Trees for the Prairies

by **DICK PATMORE**
Patmore Nurseries Ltd., Brandon, Man.

There has been a slow spread of Dutch elm disease in the United States to the south of us, and since 1960 it has been known to exist in the Minneapolis area. Some authorities have feared that the disease might eventually move northward across the international boundary into Manitoba, but while it is desirable to take such a possibility seriously and apply the necessary precautions to meet it, I do not believe we should reject the American elm unreasonably, and certainly not without adequate consideration of all the factors involved.

A good boulevard tree must be fully hardy and able to stand up under all the vicissitudes of climate. It must be able to take a city environment, smoke, fumes, paved streets, etc., without loss of vigor. Another advantage is columnar form. Without such a form, wide spreading tops interfere with wiring and lighting, also shade the grass and hinder development of boulevard turf. A boulevard tree should not grow too tall, 35 feet probably is the desirable maximum, except for special plantings where taller trees may be desired. In some cases trees as low as 15 feet in height may be desirable. Boulevard species must have roots that will not interfere with sewer and water mains, drains, etc., and this rules out the poplar family. In addition to these requirements, the tree must have beauty of form and appearance.

The **American elm** fills all these requirements. This tree has been justly considered the leading shade and boulevard tree of the prairies. No other tree can approach it in beauty of form. No other tree is so well adapted to general prairie planting. This "green cloud" as it has been called, cannot be equalled as a shade tree. While it does reach a considerable height under optimum conditions and in its natural environment, in most prairie cities it seems not to exceed the maximum desirable size. Grafted forms are now available, some of which are narrowly columnar, and all of which are conspicuously uniform in appearance.

Climatic factors limit alternatives to American elm on the prairies. Suitable alternatives include Siberian elm, green ash, black ash, basswood, in both the native and little-leaf European species, hackberry, silver maple, Amur maple, possibly Swedish aspen, and certain tall shrubs grown in tree form such as the Japanese tree lilac. Birch, mountainash and apple may be of more limited use.

Siberian elm has some advantages. It is hardy, disease resistant, adapted to prairie conditions and relatively fast growing. One considerable objection is the difficulty of growing it with a straight trunk. It develops a wide-spreading head at low levels and I do not know of any columnar selections of this species. Another objection is the heavy masses of seed it carries in late spring, creating a clean-up problem much greater than that of the American elm which is comparatively clean. By some Siberian elm is classed with Manitoba maple as one of the "weed trees" whose best use is in windbreaks.

Next to American elm, **Green ash** has been used most widely on boulevards. Its brief blaze of golden glory in early fall is its greatest asset. It leafs out late in the spring and sheds its leaves early in autumn. One fault is the tendency of seed-bearing trees to carry unattractive masses of seed through the winter; this can be avoided by planting only grafted male selections. I do not know of any columnar selection of green ash. In some areas it has been attacked by stem borer. However, it is considered one of the better alternatives to elm for boulevard use, especially its male selections.

Black ash has not been considered adapted to the drier prairie regions, but it is doing so well at Edmonton that this opinion obviously will have to be revised. Supply of both trees and seed of Black ash is limited at present. It will graft on Green ash and this probably offers the best method of propagation. Those who have grafted it find it very slow-growing when small. Probably it will be desirable to confine propagation to male selections, and preferably one with a somewhat columnar form.

Native **American basswood** is an excellent tree. Its form, spreading out broadly from the base, is not as well adapted to boulevard use as the columnar selections of other species. A columnar selection from the United States, which must be grafted, may be useful if it proves adaptable to prairie conditions, as it appears to be. An objection to American basswood is its difficulty of propagation and limited supply. In fact if one confines it to those hardy, drought-resistant upland strains from Manitoba native stands, the supply is almost non-existent and certainly quite inadequate for the requirements of prairie cities. Under unfavorable soil conditions it tends to be very slow-growing.

Little-leaf basswood, the European *Tilia cordata,* is a small tree which might be useful if dependably hardy strains were avaliable. Almost all strains on this continent, except for a few grown by some nurseries on the prairies, are definitely not hardy. This species is native to a wide area in Europe from western Europe to the northern Ural mountains and if propagating material could be obtained from its northeasterly range it probably would be suitable for prairie use.

Hackberry, a distant relative of American elm, is one of the real boulevard possibilities. It closely resembles American elm in appearance and is fully resistant to Dutch elm disease. It does not make a large tree, growing to about 35 feet, and the head does not spread out. Its seeding habits are not objectionable as its seed consists of small, hard, black berries which remain on the tree into the winter and do not create untidy conditions when they fall. When grown from northern sources it is quite hardy apart from some killing of immature tips when young. Seed does not germinate readily and is in very short supply at present, but it may be available in greater quantity in the not too distant future, grown from established prairie trees.

Silver maple might have some possibilities if a compact columnar form resistant to wind damage can be developed. Such a selection is not yet available. It would have to be grafted which is quite a problem with maple.

Sugar maple has been suggested as a possibility and would make a fine specimen. However, while selected northern strains have done well in some Manitoba areas, the winter of 1962-63 root-killed almost all of the hardy northern Minnesota and Lake Superior strains at Brandon. I therefore consider it a very doubtful possibility.

Amur maple grown as a dwarf tree is an excellent type where soil conditions are not conducive to chlorosis to which the Amur maple is very susceptible. It is striking in late September when its leaves turn to brilliant shades of scarlet and gold, and on many trees the winged seeds color attractively during late summer.

The columnar **Swedish aspen** could have considerable promise if propagation difficulties can be solved, as seems probable. Unlike the native aspen it does not sucker. It is very columnar in form, so much so that it could be used to only a limited extent to avoid a monotonous appearance on the streets. It closely resembles a small Lombardy poplar. It has desirable foliage and is quite hardy. We are not certain what effect its roots would have on drains,

but they do not seem to have the rank development of other members of the poplar family to which is belongs.

Japanese tree lilac may find some use on boulevards where a low-growing tree is desired. This species is fully hardy, develops tall, straight stems, and when pruned back to a single stem grows into a handsome small tree. Branch formation is good, foliage is dark and impressive and it usually covers in early July with large panicles of creamy, well scented flowers.

The birch family are a doubtful quantity as far as boulevards are concerned. The **European white birch,** most readily available, is, in the opinion of some familiar with it, unsuitable. It is not drought-tolerant, has a rather rank growth habit and is quite variable in form unless grafted. In areas where birch borer is a threat, it is the most susceptible of all the birch species. It is often sold as Silver birch.

Paper birch, possibly more deserving of the name of Silver birch, may be more suitable. It is native to the prairies, growing in river valleys and in some forested areas. Its adaptability to city streets has yet to be proved.

One possibility, the **Pyramidal birch,** is deserving of extended trial. It has proved fully hardy in the Brandon area. It has many features in its favor as a boulevard tree. It does not grow too tall, 25 to 30 feet appears to be a maximum. It has a close, compact, columnar head and seems quite resistant to birch borer. It has a dark glossy foliage with a waved branch formation and it holds its foliage late into October. Trees in Brandon some 35 years old are 25 feet in height. There seem to be several strains, some of which are not hardy. Pyramidal birch seems to have resisted drought better than some other birch species, with us.

Mountain ash is not suitable for boulevards unless a sterile selection can be found and grafted, as dropping berries make sidewalks and streets untidy in the fall. In some areas, birds eliminate this problem and it would not be troublesome in center or wide boulevards well away from sidewalks. The bright berry clusters otherwise are quite desirable. The columnar or fastigiate form of the European mountain ash, which must be grafted, is an excellent boulevard specimen. Because of its upright form it can be permitted to branch out low on the stem, thus minimizing sunscald to which both Mountain ash and apple are susceptible. The European species occasionally is subject to fire blight, but I have never known the American species to be affected.

Apples, including the Rosybloom varieties are subject to the same objections as Mountain ash, falling berries, and susceptibility to sunscald and fire blight, although resistance in the different varieties is variable and some appear to be quite resistant to fire blight.

The above include most of the alternatives to American elm. What is the threat from Dutch elm disease?

Two species of elm bark beetle, the native and the European, are the only means (vectors) of spreading the disease—but they do not carry the disease unless the disease has already become established. They are harmless where the disease does not exist.

Only the native beetle, the less aggressive vector, has been found in the native stands of American elm growing along certain river valleys in the eastern prairies. It has not been found in elm plantings away from these river stands.

Since the beetle is relatively immobile it seems likely that the isolation of elm plantings on the prairies will prevent it spreading away from these river valleys. When discussing this with an authority in Minneapolis last summer, I was informed that they find the spread of the disease is limited to only a few hundred feet from a center of infection, which is about the limit of

the natural movement of the beetle. Larger jumps than this are due to some other agency, usually human carelessness involving movement of beetle-infested diseased logs.

At present the disease does not exist closer than the Minneapolis area some 400 miles south of the International boundary. There is a good possibility that prairie cities, especially those situated well away from the native stands of elm have no reason to believe that the disease will ever reach them, and that if it should through some unlikely mischance, the possibilities of eliminating it are good.

As stated above, there is no other tree that can equal the American elm in grace, beauty or adaptability. This is true even in the United States where so many other species are available. Throughout that area in the United States and eastern Canada where the disease is well established, American elm is still being grown and planted.

The American Nurseryman reported in 1960 that of 30,000 trees set out that spring on Chicago boulevards, 17,000 were American elm and more would have been planted had they been available. In the June 15, 1962 issue of the same magazine an editorial states: "The conviction that the American elm will return to popular favor—when Dutch elm disease has run its course or been controlled—has support from the city of Chicago, which has announced the purchase of 10,000 American elm seedlings and their planting in city tree nurseries. The purchases were made, according to Daniel J. Coman, Superintendent of the Bureau of Forestry *on the advice of scientists who work on cure and prevention of the disease.* Mr. Coman says, "We don't want to be caught short and not have the elms, the most beautiful of shade trees."

And the November 1962 issue of the same journal reports that the Bureau of Forestry and Parkways in Chicago planted 25,000 American elm in that city over the past 5 years. It states further that in a total of close to a million American elm in Chicago, loss from the disease is extremely low. Remember this is Chicago, the heart of the area affected by the disease. Augustine Ascending elm and other grafted selections of American elm are being widely propagated and planted throughout the whole of the disease affected area in the United States. *They have learned to live with it.*

Certain elm selections have proved resistant to the disease. One which is said to have resistance appears to be hardy on the Canadian prairies. It is a columnar specimen with a very closely branched, upright-growing form.

The Nursery in Alberta

Its Different Climate Zones and Problems

by **J. McDONALD**
Lacombe Nurseries Limited, Lacombe, Alta.

In addition to the peculiar climatic conditions found in the prairie provinces combining high winds, low humidity and high evaporation and in many years insufficient moisture, southern Alberta has to contend with Chinook winds during the winter months when snow cover disappears entirely.

During these Chinook periods, usually in January through March, growth often starts, only to be frozen down again when the next cold spell arrives. This is a continuing challenge not only to nurserymen but to amateur gardeners as well. Central and northern Alberta do not have this problem but are confronted with a shorter frostfree period in which to mature and ripen growth so that winter-killing will not be a possibility.

In southern Alberta the growing season extends from early April to the end of September. The Central zone, from 100 miles north of Calgary to 100 miles north of Edmonton, has a shorter frostfree period of approximately 2 weeks, depending on the season. This is the area of greatest population and consequently has the major concentration of commercial nurseries. The Peace River zone has a still shorter frostfree period but makes up for this handicap with longer summer days, although certain fruit trees and ornamental varieties cannot be grown successfully.

Natural variation in growing conditions, soils, sites, amount of shelter, rainfall, proximity of large bodies of water, and abrupt changes in altitude, may cause local areas in any zone to be more or less favorable.

Some details of the horticultural zones follow:

Lethbridge-Medicine Hat—125-155 days frostfree period. With irrigation, this zone will produce specialized crops. It is subject to severe Chinooks and nursery stock of all kinds requires an abundance of shelter. Elevation 2,000-3,300 feet, with high evaporation.

Brooks Area—120-135 days frostfree period. An extremely dry zone. With irrigation will produce specialized crops. Not so subject to severe Chinooks. Elevation, 2,000-2,400 feet, with high evaporation.

Fort Macleod - Calgary - Drumheller — 100-120 days frostfree period. Zone of limited moisture. Suitable for all horticultural crops in selected areas. Elevation, 2,000-3,000 feet, with moderate evaporation.

Olds - Edmonton - Vermilion — 100-120 days frostfree period. Ideally suited for growing general nursery stock. Elevation, 2,000-3,300 feet, with moderate precipitation and low evaporation.

Peace River - Grande Prairie (Peace River Block)—90-100 days frostfree period. Elevation 2,400-4,000 feet, being low to the north with variable precipitation and evaporation.

Wind is an important factor in hardiness. Properly placed shelter belts for farmsteads and hedges or fences in urban areas are a must in most zones described above. With adequate protection local climates may be created, enabling the growing of less hardy varieties and also cutting down evaporation of moisture and soil drifting.

Alkali soils in Alberta present a serious problem in growing ornamental plants. Very few areas in the province require the addition of lime, due to the high pH of soils generally. Because of the higher pH soils, we encounter

problems of chlorosis or yellowing of foliage. This condition is most noticeable in spiraea, roses, potentilla, mountain ash, fruit tree varieties and raspberries. Russianolive, Villosa lilac and Colorado spruce are recommended where chlorosis is present.

Due to the breeding of resistance to fire blight by the Government Research Specialists in ornamental Rosybloom crabs, fruiting apples and crabs, this serious threat to the above species has been greatly reduced. Cases of infection in cotoneaster and mountain ash have been encountered in some areas.

Winter injury is another serious problem and particularly with low-growing evergreens such as cedar, juniper and dwarf spruce. This is due mainly to low humidity during the winter and limited snowfall. Such plants should be covered with snow where available, wrapped in burlap or planted in shaded areas to be successful year in and year out.

Because of our shorter growing season, low humidity and winter temperatures, plants such as azalea, deutzia, forsythia, hibiscus, kolkwitzia, magnolia, pyracantha, weigelia and many very desirable varieties of ornamental evergreens do not thrive in the prairie provinces with our level, open country where winds have a full sweep. If we were blessed with an additional month of frost-free weather to ripen the wood, we could almost double our present range of hardy varieties.

Propagation of plants in Alberta is similar to the other parts of Canada but, due to our climate, methods and timing are very essential. Experience, following many failures, is the only answer to success. Due to this, propagation costs are higher than in more favored parts of the country, resulting in higher prices to prairie residents.

No protection is given to plants growing in the open fields. They have to stand on their own merit and this is the determining factor in varietal selection. Most home gardeners do not wish to baby half-hardy plants through the winter by wrapping or covering.

The nurseries of the prairie provinces are very fortunate in receiving excellent co-operation from the federal and provincial Horticultural Research Stations who carry on continuous and extensive work in the field of varietal hardiness and the introduction of newer, hardy varieties of trees, shrubs, fruits and perennials.

The nursery industry will continue to provide newer, hardy varieties in quantity and quality, coupled with helpful information and service, to make our prairie provinces more beautiful and fruitful.

Sign on Highway No. 2, north of Prince Albert, showing turn-off for new DNR Forest Nursery.

Saskatchewan's Provincial Forest Nurseries

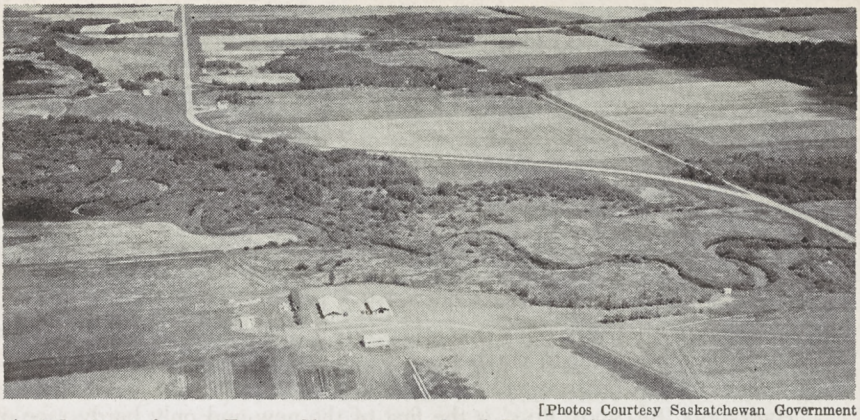
by **W. R. PARKS, Director of Forestry**
Department of Natural Resources, Saskatchewan
Prince Albert, Sask.

Demand for nursery-grown forest stock in Saskatchewan for planting at provincial recreational areas such as provincial parks, public reserves, picnic areas and highway camping grounds, prior to 1960 had been very erratic. However, in more recent years the demand has far exceeded the supply of stock available from provincial nurseries as the provincial government continues to implement its program of further developing existing provincial parks and establishing new parks, public reserves, picnic and camping grounds. This program is concentrated, for the most part, in the south portion of the province which is virtually treeless.

Prior to 1962, only one provincial tree nursery was in operation. It is located at Big River, Sask., and until that time had produced in its peak years about 350,000 trees annually for field planting. But, with the introduction of mechanized equipment and new operational techniques, the capacity of the Big River Nursery has grown to an annual production of 750,000 trees. This at the present time, is sufficient to meet the needs of provincial reforestation programs and the demand from farm co-operators for trees for woodlot development and establishment purposes.

In 1959, only 25,000 trees were planted in southern Saskatchewan at provincial recreational sites. By 1964, this figure had risen to 420,000 trees, and plans for 1965 specify the planting of 670,000 trees and shrubs. It was soon evident that existing provincial facilities could no longer cope with this expanding demand for trees, and that establishment of a new provincial forest nursery was a necessity. Thus, in August 1961, the Prince Albert Forest Nursery was officially opened. In the following year, it became operational with the sowing of initial seedbeds. First stock shipments were made from the new nursery in 1964 but the nursery will not become fully productive until 1966, when it is expected that 1,500,000 trees, shrubs and cuttings (mostly broad-leaved species) will be available for field planting.

In the meantime, provincial authorities have had to rely on the Dominion Government nurseries at Indian Head and Sutherland for sufficient stock to implement current programs. Since 1960, these 2 nurseries have generously supplied the Saskatchewan government with over 540,000 trees for recreational planting, but in 1966 provincial tree-planting programs (with the exception of some special material for landscaping purposes) will be self-supporting in that sufficient stock will become available at Prince Albert to meet provincial recreational needs.



[Photos Courtesy Saskatchewan Government

Aerial view of new Forest Nursery north of Prince Albert, showing buildings and acreage.

To date, 5 structures have been erected at the new Prince Albert Nursery. These include a combination warehouse, garage and office; a fully modern seed extraction building complete with cone and seed storage facilities; a combination lunchroom, washroom and cutting storage building, with an attached greenhouse; a pumphouse; and a superintendent's residence. All the buildings are of modern design with arch beam construction providing clear floor space in the warehouse and seed extraction buildings. Future plans call for the erection of a tree-packing shed and cold storage room.

The new nursery, accessible from Provincial Highway No. 2, is centrally located, facilitating shipment of stock to all parts of the province. Seven fields or plots currently are under cultivation and provision has been made for future expansion by setting aside 3 reserve fields. Shelterbelts have been established around the nursery perimeter as well as around the various individual fields. Field irrigation uses aluminum surface lines and rotating sprinkler nozzles. An electrical pumping unit supplies 965 U.S. gallons of water per minute to the system.

At the Big River Nursery, production is geared to reforestation and woodlot requirements. Thus, only conifer species are under cultivation. These include white spruce, jack pine, lodgepole pine, and red pine.

Species grown at the Prince Albert Nursery include white spruce, Colorado blue spruce, jack pine, Scots pine, lodgepole pine, various bybrid poplars and willows, American elm, Manchurian elm, green ash and Manitoba maple.

Distribution of forest nursery stock from provincial forest nurseries in Saskatchewan is restricted to government projects or to those projects approved by the government. Thus, trees are not for sale or distribution to the general public. An exception is made to this policy when the nursery stock is for farm woodlot development or establishment purposes.

Some Perennial Plants for Mid-Summer Bloom

by **ALAN SCHARF, P.Eng.**
Saskatchewan Research Council, Saskatoon, Sask.

The peonies and the Patterson lilies usually mark the end of significant bloom in the perennial garden. From then until the chrysanthemums and asters begin to flower, it is the annuals that hold the spotlight; and some gardeners like it that way. However, there are a number of perennial plants which are showy enough to compete with any annual, and which deserve a place in any garden.

HEUCHERA 'BRANDON PINK' is the first of the new and only hardy race of coral bells and is the progeny of a cross between *H. richardsonii,* our unattractive prairie native, and *H. sanguinea,* its tender, but showy, southern cousin. This cross was made by Mr. H. H. Marshall of the Brandon Experimental Station. Brandon Pink is in full bloom about the first of June, but carries right on into August. This certainly is one of the outstanding new perennials for the prairies. The foliage is evergreen and the plant height is 2½ feet.

'WHITE PRINCESS' is the only well known Patterson lily belonging in this group, blooming a full 2 weeks later than most. White Princess is a bit slower than some to establish, and it may not be until the third summer following fall planting that it shows its full majesty.

MONARDA HYBRIDS. Again by crossing a hardy prairie species with a tender, but more attractive, variety, Mr. Marshall has developed a superior strain for the prairies. Plants are not yet generally available but gardeners should watch for them. They should be divided annually to keep them in bounds, both horizontally and vertically. The Marshall hybrids bloom from about mid-July to mid-August.

The season can be extended by growing some of the tender southern sorts, such as Cambridge Scarlet, or Croftway Pink. These bloom about 2 weeks later, primarily because of winter damage, and some winter loss should be expected. Nearly all of the Monardas grow about 3 feet high.

HELIOPSIS 'GOLD GREENHEART' is a good yellow perennial, blooming from mid-July to early September, and looking much like a 3½ foot high marigold. It should be placed where some sprawling can be tolerated.

The CHINESE DELPHINIUM, *D. sinensis, grandiflorus,* or *chinense,* is a 12-inch, short lived, but very showy delphinium, in extraordinary shades of blue, or sometimes white. The plants tend to self-sow sufficiently that the stock can be maintained from one initial planting. Peak bloom is most often in the last half of July, but varies from year to year depending somewhat on the age of the individual plants. Nursery plants are not often available, so you will likely have to get your start from seed.

Both the Chinese delphinium and the common tall delphinium, *D. elatum,* are subject to attack from the delphinium worm *(Chrysoptera moneta).* This pest is not yet well known, but is capable of completely destroying a season's bloom just as thoroughly as can the more notorious slug in warmer, wetter climes. As a preventive measure, all delphiniums and monkshoods should be sprayed or dusted with DDT at 4 one-week intervals starting on about May 7. Care must be taken to assure that the insecticide reaches the growing tips and adjacent leaves. If the early May applications are omitted, some of

the new systemic insecticides may be useful in killing those worms which have gotten themselves into relatively inaccessible parts of the plants.

LAVATERA CASHMIRIANA, or *L. cachemiriana,* grows up to 3½ feet tall with purplish pink, mallowlike flowers, blooming from mid-July to mid-August and beyond. Individual plants will often live only 3 or 4 years, but like the chinese delphinium it self-sows just enough to make stock maintenance easy.

GLOBE THISTLES, with their steely blue, globular flower heads, coarse foliage, and prickly stems, are almost garden freaks. However, *Echinops 'Taplow Blue'* in late July or early August, and the week or so later and smaller *Echinops dahurica* do add something unusual to the rear of the bed. These 3-4 foot plants are best staked at blooming time.

PHLOX PANICULATA, the tall garden phlox, in its hardy white form, should be in every garden. A well grown phlox adds real distinction to the border during late July and early August. The hardy purple form, often described in the catalogs as pink, is of lesser importance but still has a place. *Phlox paniculata* usually grows 2½-3 feet in height.

DICENTRA 'BOUNTIFUL,' a recent hybrid bleeding heart with pink flowers, and growing about 18 inches tall, also deserves mention in this list. While never really showy, Bountiful blooms from early June right through to late September. A group of three plants might be somewhat more noticeable.

SKINNER'S SCARLET TRUMPET honeysuckle is a woody perennial vine which will bloom through most of July and August. The orange-red flowers are most attractive and continue sporadically right up to hard frost. It must be grown on a trellis, and some winterkilling of the top should be expected. Height is 6 feet or more.

HYDRANGEA ARBORESCENS appears to survive here in protected situations that are not sufficiently temperate to support *H. paniculata grandiflora,* the much ballyhooed *P. G. hydrangea. Hydrangea arborescens* is often called the snowhill hydrangea, and grows with a coarse texture, up to 4 feet in height. The showy cream-white flowers are produced in large flat clusters up to 10 inches across, starting in late July and continuing into September. The plant often freezes back severely, but this is no detriment, as in fact it should be pruned back very hard each spring in any case for best bloom.

MEANINGS?

The Latin names of most plants have direct significance. For example:

Colors: alba, white; azureus, blue; auranticus, orange; aureus, golden; carneus, flesh-colored; luteus, yellow; viridis, green.

Blooming Period: praecox, very early; majalis, May-blooming; astivus, summer; vernalis, spring.

Leaf Shape: brevifolius, short-leaved; angustifolius, narrow-leaved; latifolius, broad-leaved; laxiflorus, loose; pyrifolius, pear-leaved.

Blooms: flore-pleno, double-flowered; formosus, handsome; grandiflorus, large-flowered; admirabilis, noteworthy; ornatus, ornate, adorned; odoratus, scented.

Size of plant: altus (also excelsus and elatus), tall; nana, small; pumilio, dwarf; altissimus, very tall.

Low-Growing Perennials and Shrubs

by **MRS. A. R. HOOD, B.S.A.**
Hood's Nurseries, Selkirk, Man.

To assist the enthusiastic gardener in choosing suitable plants for a specific location or desired effect, some of the lower-growing perennials and shrubs that do well in the Winnipeg area and farther north are classified below according to their type of growth.

Group 'A' — Creeping Plants that look at home among rocks, or may be used as a ground cover or as edging for the perennial border. These do not usually spread too vigorously, but growth does vary considerably in different localities. To propagate, most may be divided in early May or, preferably, during a cool spell in August. The appearance of some, e.g., thymes, sedums, dwarf veronica, is improved by trimming off faded flower heads.

Pussy toes *(Antennaria microphylla)* — If kept moist, this grey carpet is sturdy enough for a path.

Aubretia forms neat low mounds of attractive foliage covered with pink or blue bloom in spring and occasionally later. It needs sandy soil and grows in sun but will bloom longer if partly shaded.

Mauve Mountain Daisy *(Erigeron leiomerus)* — Although a rather shy bloomer this plant does form a sturdy mat and is well worth growing for the years that it does put on a show.

Dwarf Burning Bush *(Euonymus nana)* — A spreading broadleaf, evergreen shrub that grows well in sun or shade. Interesting scarlet fruit similar to the bittersweet is borne on even young plants. Other species also would be worth trying.

Evergreen Candytuft *(Iberis sempervirens)* — Nice foliage, covered with a mass of white bloom in June. This thrives in full sun, rich, well drained soil, with extra winter protection if not covered by snow.

Japanese Spurge *(Pachysandra terminalis)* — Does quite well here if kept moist.

Juniperus — There are several low-growing junipers that are prized possessions. All should be protected from spider mites and from sunscald or the drying effect of the late winter sun. Bar Harbour *(J. horizontalis glauca)*, a lovely, silvery blue creeper, does well here.

Pachystima Canbyi — A broad-leaved evergreen shrub that is very ornamental in any sunny spot with its smallish, dark green leaves. Snow cover is necessary to bring this through our winters in good shape.

Moss Phlox *(P. subulata)* — Very showy about apple blossom time when the low evergreen mounds are covered by pink, white or blue bloom. Sometimes the center of the plant kills out, but the younger shoots will give a bright display in a sunny, well drained spot.

Stonecrop *(Sedum)* — Is an old reliable rockery plant with succulent evergreen leaves and yellow flowers. Rosy Carpet is similar, except that the long-lasting flowers and seed pods are an attractive pink shade. A more upright species has variegated foliage, yellow flowers and scarlet seed pods. In older rockeries with large areas of sedum overrun by quack grass, dalapon may be used to kill the grass without permanent harm to the sedum.

Thyme *(Thymus)* — These popular evergreen creepers are nice between stepping stones or as a carpet in sun or part shade. There are several species

and varieties, growing to from 1 to 8 inches high, some with fragrant foliage, and usually pink flowers in July.

Veronica — The dwarf species with 4-inch spikes of royal blue in June will form a thick mat in almost any location. A pink variety of *V. spicata* is a nice little upright specimen if watered when dry.

Group 'B' — These creepers are useful to clothe an area quickly, but could overrun more desirable plants.

Snow in Summer *(Cerastium tomentosum)* — The silver-grey foliage is covered with white bloom in June. This does well in a sunny, dry location such as a rock wall or a steep bank.

Periwinkle *(Vinca herbaceae)* — This species, hardier than *V. minor,* has bright blue flowers in late spring. Plant in sun.

Group 'C' — These upright or rosette-type plants are easy to manage as they 'stay put.' All have attractive foliage, making them suitable for the front of the perennial border or in choice locations in the rockery.

Silver Mound *Artemesia* — Is an eye-catching, dependable plant that seems to thrive despite drought or spring flooding, as well as being free of pests. In a sunny location it makes a dense 6-inch mound; grows taller in shade.

Fall Asters — Dwarf varieties such as Morden Cupid, white, and Morden Fay, pink, can be depended upon for that last flash of color before the snow flies. Autumn Princess is another sturdy pink about 10 inches high, or perhaps taller elsewhere.

Bountiful Everblooming Bleeding Heart *(Dicentra* hybrid) — Is a choice specimen about a foot in height, with nice foliage and long-lasting pink blossoms that, even when fading, are not unsightly. It likes full sun and loamy soil.

Brandon Coral Bells *(Heuchera)* — Tiny pink bells on long stems over a rosette of geranium-like leaves make this something different for a sunny spot with rich soil.

Plantainlily *(Hosta)* — Grown mostly for their foliage. A variegated type has leaves that are attractive in smaller flower arrangements. Keep moist, preferably in partial shade, and protected from slugs.

Hen and Chickens *(Sempervivum globiferum)* — This is a favorite, especially with the children, because of the interesting way in which the many young plants develop on tiny stems above the mother plant or 'hen.' The rosettes of succulent green leaves are easily established in sunny, well drained spots, thriving in rock crevices. Other species are larger, up to several inches across, and colored red to brown.

Group 'D' — These spread by volunteer seedlings so may be considered weedy. However, they are easily pulled where not wanted.

Maiden Pink *(Dianthus deltoides)* — Has shiny foliage and profuse, rosy June bloom. Seed pods must be cut off for best appearance.

Baby's Breath *(Gypsophila repens)* — Has single, pale pink flowers all summer. Rosy Veil, double pink, will not seed itself, but likes quite sandy soil. Bodgeri is better here but difficult to obtain.

Johnny Jump Up *(Viola)* — These cheerful miniature pansies appear from first thing in the spring until covered with snow if watered occasionally. May serve as a ground cover for hardy lilies. Native violets are nice naturalized in shady spots.

Fall and Winter Care of Corms, Tubers, etc.

by **JOHN WALKER**

Plant Science Department, University of Manitoba, Winnipeg

Lifting these storage structures from the garden should be delayed as late as possible. This results in better maturity and development of the storage parts, and a shorter storage period. If warm weather continues after dahlia stems are first frozen, sprouting from new buds at the base of stems may occur on some varieties. Corms as represented in crocus, gladiolus and yellow calla, contain storage food for the new plant. Crocus corms can be left in the border.

A good date for lifting gladiolus corms may be October 15, depending on quantity to be harvested, weather at the time, and facilities for drying them (Oct. 30 was our date in 1963). Tops are cut off ½ inch to 1 inch above the corm at digging time and the corms are placed in containers suitable for size of operations, in a dry, warm (70°F) place for 3 or 4 weeks.

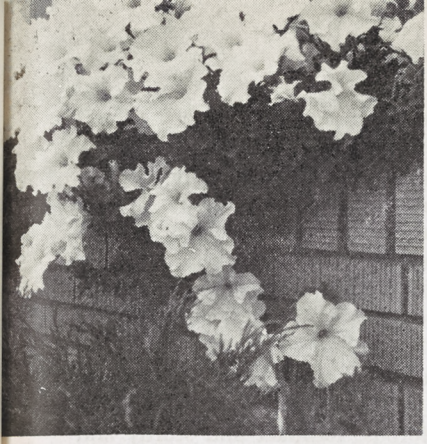
When dry the old corms and cormels are removed, stub of flower stem is broken off, and a majority of dry leaf-bases are loosened. Presence or absence of disease can be noted, and the development of new roots and shoots the following spring will not be restricted. It is a good plan to dust the corms with a suitable fungus-insecticide before placing corms in storage where there is free air movement and a temperature of 40-50°F.

Yellow calla is much more susceptible to frost damage than gladiolus. Storage date may be October 5. Tops are cut off but soil left around the corms will provide protection in storage. Surround the whole mass with moist peat moss; storage temperature should be 40-45°F. (Yellow calla succeeds quite well when several corms with surrounding soil are planted together.) Oxalis *(O. lasiandra)* may be handled like yellow calla.

The fleshy tuberous root of the dahlia contains stored food for support of the new plant. Dahlia stems are very susceptible to frost damage. For the most part, tuberous roots disintegrate during their second year. The first two weeks of October is a good time to dig and store dahlia roots. They need a couple of days in a frost-free place for the surface of roots and stems to dry, and a few inches of stems may be left to which the variety name may be attached.

If not too large, crowns may be stored as dug from the garden. To save space, crowns may be divided but each division must have a portion of the herbaceous stem attached to the tuberous roots. *Buds to produce the shoots the following year are located near the base of each stem.* Shallow boxes that permit free air movement around the stored roots may be used as storage containers. Before placing damp peat moss below and around the roots, *all wounds on roots and stems should be dusted with sulphur or other fungicide.* Temperature of storage room should be around 38°F.

A tuber as found in tuberous begonias is a perennial storage structure. This plant may be grown indoors or outdoors. If grown outdoors, plants may be kept in pots plunged to rim. This facilitates bringing the plants indoors to be enjoyed for a longer period of bloom, *before* stems are cut down by frost. Light frost will destroy the stems. Stems that have become dry are cut off and storage conditions suggested for dahlias are provided also for tuberous begonias. When tubers are removed from pots (or from the border, possibly around Oct. 5), a cushion of soil is left around them for protection during the storage period. (*Concluded on page* 71)



White Cascade in the author's planter, 1964. A truly magnificent petunia variety.

Petunias for the Prairies

by **S. SHEARD,**
Horticultural Specialist,
Saskatchewan Department of Agriculture

Checking through a couple of seed catalogues the other day we noted that one of them listed one hundred and sixty-four varieties of petunias and the other listed one hundred and twenty-three varieties. The trend these days seems to be for seedsmen to try to outdo one another in the number of varieties they list and in the glowing praise they sing of each one. Every year more new varieties are added to the confusion and each and every one of them, according to the catalogs, is tops in its class. Actually, the list of petunia varieties presently available to western gardeners is at least one hundred varieties too long. Sensible seedsmen will offer their customers a choice of not more than twenty to twenty-five varieties recognized for their all-around performance. The oscar winning All-America Selections which seem to appear in ever increasing numbers each year should be left for the garden columnists to rave about until such time as they are proven satisfactory for prairie Canada. Some of them, of course, do turn out to be useful varieties. Many of them are dismal failures.

Most gardeners in the Prairie Provinces, we believe, want petunia varieties which produce compact, sturdy plants that stand up well under the onslaught of wind and weather, which bloom early and profusely, which have flowers that don't wilt in the heat as soon as they are fully open and which are able to bloom and provide color long after the first light frosts. Very few of our present varieties possess all or most of these characteristics, in spite of attempts by seedsmen to convince us otherwise.

In an attempt to create a little wider interest in petunia varieties for their performance, as well as for their color, we are presenting here our own personal rating of ten varieties we like best, listed in order of preference.

Fall and Winter Care of Bulbs (Concluded)

With both dahlias and tuberous begonias, it is a good plan, around New Year time, to carefully remove the storage covering of peat moss, moisten it slightly and replace it around the storage structures; avoid excessive drying out.

Gloxinia tuberous roots are best stored for 4 to 6 months (mid-August to February), at 45 to 50°F temperature, either in pots or perforated polybags away from the light. Amaryllis is stored in pots in similar temperatures but for a period of only 4 months (August to December), *and in darkness.* Complete desiccation must be avoided. Easter Lily bulbs are placed in cold storage (36°F) around mid-August in polybags surrounded by moist peat moss. If potted in early January, and given a temperature around 68°F, the plants should bloom early in April.

Doubtless many readers will disagree with some of our choices but this is quite natural.

1. White Cascade – the finest white available and unquestionably the best of the Cascade series. Large flowers with good substance and one of the earliest of all petunias to bloom. Has an excellent cascading habit which makes it ideal for planters and window boxes as well as for bedding (see photo).

2. Sugar Plum – an orchid-lavender color with dwarf, compact plants which stand up under wind and weather better than any other variety available. One of the most free flowering of all petunias.

3. Coral Satin – a bright coral-rose color with glossy petals, produces masses of bloom on compact, sturdy plants.

4. Pink Satin – rose-pink, extremely floriferous, compact and sturdy and has the ability to withstand early frost better than most varieties.

5. Comanche – a popular scarlet red which many people rate No. 1. Short, compact plants with blooms which hold their color extremely well. Unquestionably the best of the red varieties.

6. White Magic – tops in its field before the introduction of White Cascade. Large, pure white, ruffled blooms borne in great abundance on compact, sturdy plants. Early flowering.

7. Blue Lustre – a bluish-purple color which fades considerably in hot sun, but still quite striking. Extremely free flowering with large blooms on sturdy plants.

8. Satellite – a bright rose color with a white star. One of the most free flowering of all petunia varieties, producing masses of small, bright blooms throughout the summer. Has a tendency to grow a shade too tall, though not objectionably so.

9. Calypso – a large-flowered scarlet and white bi-color which again is unquestionably the best in its class. The color markings vary considerably from one flower to another but this in no way detracts from its charm. Plants are compact, sturdy and free flowering.

10. Capri – a comparative newcomer which may require another season or two to prove its real merit but which performed extremely well in 1964. Flowers are a showy clear blue color, borne freely on sturdy plants. If you haven't grown it, give it a try in '65.

Now just a short note about a few highly rated varieties which we have found disappointing:

Crusader – a rose-pink and white bi-color which is extremely free-flowering but in which the color ratio is about 80 per cent white to 20 per cent pink. It has so much white that the pink barely shows in a massed planting.

Polaris – a blue with a white star which has very soft petals that droop as soon as the flower opens. Plants also tend toward tall, open type of growth.

Peaches and Cream – petals are soft and droopy and plants have absolutely no frost tolerance.

Sabre Dance – under our conditions it blooms more sparingly than some of the giant doubles.

Multiflora Doubles – we have tried Cherry Tart and Cardinal and both have been disappointing. They bloom late and very sparingly, seem to do the best in late August and early September when the growing season is about over.

Finally, a word or two about the large-flowered double petunias which so many people have raved about for years. Maybe you've already guessed it but – *we hate them.*

Zinnias and Violas . . . Two Garden Favorites

by **H. R. PFEIFFER**
Garden Foreman, Assiniboine Park, Winnipeg, Man.

ZINNIAS

The popular Zinnias are a group of valuable Mexican annuals belonging to the Daisy family, *Compositae,* that have won themselves a deservedly favored place in most gardens.

Praise and recognition should be given freely to the hybridizer, and to the plant and seed selection people. The fruit of their patient work has enriched the range of Zinnias as with all plant selections.

For best results under prairie weather conditions, seedlings should be started indoors, though seeding directly in open ground after danger of frost is past has proved satisfactory. A warm, sunny, well drained, medium fertile location is preferred, but semi-shade is tolerated. The plants should be watered freely in hot weather, and a loose mulch, like strawy manure, can be an asset.

Not many pests occur, but occasionally stem borers, tarnished plant bugs and leaf feeders are found. In periods of high humidity some mildew can develop. For these, as for many other garden plant troubles, a preventive program of dusting or spraying with the recommended materials should be followed.

Zinnia elegans is the most widely grown because of its generous range in color, size and form of blossoms, height of plant, and relatively easy culture.

In the dwarfs, a 1963 introduction named Thumbelina grows a dome-shaped plant in a variety of mixed colors, 6 to 8 inches high. Another dwarf is the Tiny Cupid, 12 inches tall, with Red Button and Pink Button, 10 to 12 inches high, recommended for trial.

Next in height are the Lilliput, Baby or Pompom zinnias, growing to 12 to 18 inches high. In this height range also are two so-called Mexican zinnias, 10 to 12 inches tall. Persian Carpet has a good color range, its pointed petals tipped or bordered with a contrasting shade. Old Mexico's deep mahogany red petals are edged with bright gold shades.

The Cactus-flowered type of zinnia has profited from a number of late introductions. The plants range from 20 to 30 inches high and most varieties have blooms 6 inches across. Some of the more striking are: Firecracker, bright red; Bonanza, radiant light golden orange; Princess, light salmon pink; Miss Universe and Treasure Island, color blends.

Similar in form but more ruffled and quilled are: Empress, rose pink; Red Man, brilliant scarlet; Snow Man, snowy white; Sun God, glowing mid-yellow; Pride of Dieldrin, mandarin red; Glamour Girls, pastels; and many others.

Another group are the Giant Dahlia-Flowered, 30 to 36 inches tall, with blooms 5 inches across and 2 inches deep. Their growth habit resembles dahlias. In mixed colors they are very showy but they are available also in separate colors. Some of those on the list would be: Royal Purple, distinct; Canary Bird, yellow; Will Rogers, scarlet red; Oriole, orange gold; Polar Bear, best white; Illumination, deep rose.

Finally, we have as a group the Giants of California. Their height and habit are not unlike the Dahlia-Flowered; the difference is in the bloom. Some are 5 to 6 inches across but only about 1 inch in depth. The petals are more

loosely placed, giving the flower a graceful and distinctive shape. Some of the color varieties are: Purity, white; Enchantress, rose; Scarlet King, bright color; Golden Queen, yellow.

In addition to these main groups are some other varieties worth mentioning. On top I would put Scabious-Flowered, 30 inches high, a distinct and attractive strain of mixed double flowers. Others are: Peppermint Stick, 24 inches high, flowers striped in various combinations, some mottled, 1½ to 2 inches across, mixed. Ortho Polka, 24 inches high, flowers 3 inches across, interestingly striped, mixed. Fantasy, 24 inches high, shaggy, double, cactus-dahlia-like flowers, 3 to 3½ inches across, mixed. A recent introduction is a giant tetraploid called State Fair, one of the tallest. It grows to 36 inches, a husky, strong plant, with flowers 6 inches across well formed in a wide color blend.

Lastly are the small, single-flowered varieties, comprising *Zinnia angustifolia (Haageana),* 18 inches tall, rich orange; and *Zinnia linearis,* 12 inches, yellow and orange flowers. Also, as the foliage is less coarse in these, they give a valuable contrast of their own in a flower border.

I hope that you share my opinion that with this plant group, Nature has endowed us with something to behold and to cherish.

VIOLAS

As the song "Sweet Violets, Sweeter Than the Roses" suggests, strong sentiment and romantic attachment are felt for one of the species in this sizeable group of plants. Even in commerce the color and scent have found distinction.

The genus *Viola* includes a large group of chiefly perennials, though some are annuals. In the genus we find a wide range of beautiful rock garden and woodland plants, as well as the more horticulturally developed Pansies, Bedding Violas and Sweet Violets.

Pansies *(Viola tricolor maxima)* are descended or have ascended largely from the native European wild violets, *Viola tricolor* and *Viola lutea.* Bedding Violas originated as hybrids between pansies and *Viola cornuta.* Sometimes they are called Tufted pansies. Under favorable climatic conditions, these are longer lived than pansies, which usually are regarded as biennials. Pansies resemble Bedding Violas but differ in being of less compact growth and having flowers which usually are larger and distinctly marked or blotched to give the appearance of a 'face.'

A curious feature of many species of violas is that they produce two distinct types of flower, and this trait is well shown by the Sweet Violet itself. The showy flowers, for the sake of which next to its fragance the plant is grown, usually are sterile and produce no seeds. In addition, the plants produce what are called cleistogamus flowers which come later than the showy, scented ones. These are inconspicuous having no showy petals, and are produced on short stems close to the ground, they are fertile and produce seeds. Pansies and Bedding Violas however produce seed from normal showy flowers. Pansies and violas commonly are propagated by seed, although in climates with cool summers propagation by cuttings is used.

Across the prairies and wherever winters are severe it is best to seed them in late January or early February, in a greenhouse or similar environment, and later transplant to flats. When planting-out time approaches, gradually harden off the plants before transplanting to the open garden. In the seedling stage they should be kept in a maximum of light and cool temperature to attain sturdy plants.

In the garden they thrive best in cool, moist soil, shaded from the hottest sun. The soil should be rich and well worked. Thorough watering in dry

weather and occasional applications of weak liquid fertilizer will benefit them considerably, as will mulching with peat or the like. Once in bloom they should be gone over regularly for removal of faded blooms to prevent seed formation.

The difference between pansies and violas in growth habit will show as it may become necessary to trim the straggly growths of pansies back to promote continuous bloom, whereas the bedding violas may not have to be subjected to this treatment, being generally more compact.

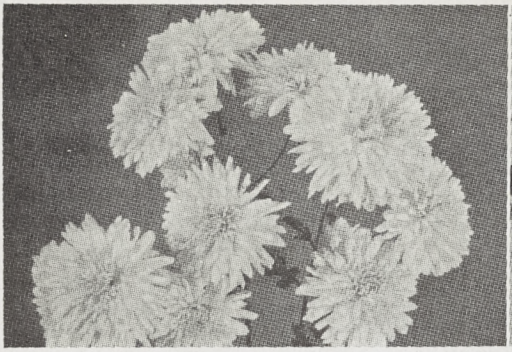
In the pansies the varieties are rather numerous. Next to the varied Giants in straight or mixed colors, there are different hybrids and strains. One to note is King of the Blacks, a coal black pansy. The Bedding Violas are as numerous. In the mixed, the Clear Crystals and Grandiflora should be a good choice. As to straight colors the Giant White, Giant Yellow, Arkwright's Ruby, Mountain Guard (deep purple) and Perfection Blue are worth noting. Viola Violettas and *Viola nigra,* the latter listed as a hardy annual, are of interest.

Now follow the species that all the poetry is woven around, *Viola odorata* or Sweet Violet, a native of Europe and the parent of all the single and double varieties of Sweet Violets. Although mostly grown in greenhouses either on bench or in pots for the florist trade, it can be established in the garden providing the soil is well worked and somewhat shady in location.

For use in rock gardens or like spots are the following: *Viola pedatifida* or Crowfoot Violet, native in parts of the prairies, dark blue, and summer-flowering; *Viola Missouriensis,* fairly hardy, seeds itself, rosy purple, fragrant; *Viola altaica,* dark blue, summer-flowering, the shiny foliage an added attraction; *Viola gracilis* hybrids, grow to 12 inches, summer-flowering, violet and yellow. *Viola tricolor,* the Johnny-jump-up, Heartsease or Wild Pansy, is a charming kind in many color variations, resembling miniature pansies, 6 to 12 inches, and self-seeding.

Here a short note on insects and disease will be in order. Indoors, aphids can occur, also red spider, the latter more so outdoors. Leafspot, wilt, and root rot occasionally show up. A regular spray or dust program should be followed with recommended materials.

And so, after giving it some thought, little does one wonder that the violas in their variations, command and hold the admiration of many people.



Abbe

Akimina

Hardy Early-Blooming Mums for Western Canada

by **EDWARD J. LORD**
Banff Trail Nurseries, Calgary, Alta.

The recent introduction of a number of Chrysanthemums that are hardy enough to stand the winters of the Canadian prairies, and that bloom early enough to flower before the earliest fall frosts, should be, I feel, brought to the attention of those not already familiar with their performance and beauty.

The credit for the work in producing and introducing these 'mums' goes to our good friend Dr. I. L. Nonnecke, formerly of the Canada Agriculture Research Station at Lethbridge, Alta., and now with Asgrow Seed Company, Brooks, Alta.

As far back as 1954 Dr. Nonnecke received from Prof. Viehmeyer of North Platte, Nebr., seeds of various chrysanthemum lines that had proved hardy and satisfactory in that state. They were germinated and planted out, and after selecting seed from the better-flowering plants and repeating the procedure plus cross pollinating, in 1960 he named and released for distribution 11 varieties that were superior in quality and size of flowers to anything we previously had in Alberta, were free-flowering, and could stand our Canadian prairie winter without mulch or cover. These 11 varieties covered the color range from white to bright mauve and were given Indian names.

Dr. Nonnecke continued his research and selective crossbreeding, until in 1963 he named and released a further 10 varieties. These later releases in most instances were somewhat superior to his 1960 releases; some were considerably more dwarf, bushier in nature, and covered an even greater range of colors.

Both the 1960 and 1963 groups are very hardy, require little attention and culture, are not too fussy as to soil conditions, but do show better results if the phosphorus content in the soil is kept high. Chrysanthemums prefer full sunlight but will tolerate some shade. Good drainage is essential for growing plants. Well rotted organic matter should be worked deeply into the soil to allow excess water to escape. The plants should be spaced at least 18 inches apart as they are vigorous growers. Overcrowding will cause small, weak blooms, and because of their vigorous growth they should be kept well back in the flower beds to prevent them taking over.

The plants can be grown in the garden area and be moved into the flowerbed toward fall, even in full bloom if lifted carefully and the roots are

not damaged. Wintering is not difficult. We have found it best to leave the dead tops on until spring as they catch and hold the snow. Removing the tops in the fall and mulching seem to cause plant losses.

They grow into mature plants very rapidly; a small, young plant put in this spring will bloom and put on a terrific show by early fall; and by midsummer of the following year can produce a plant with a 24-inch spread at the top, and as many as 200 blooms at one time. The flowers are large, long lasting, non-fading, and excellent for cut flowers.

These hardy chrysanthemums will give more value for the plant dollar than almost any other perennial. They are being supplied from Alberta, across Canada from the Atlantic to the Pacific, with a promise of more releases in the future, of even more dwarf varieties (some bordering on the Cushion class), and possibly a still greater range of colors.

The following is the list of names given these chrysanthemums and a brief description of each:

1960 Releases:

Kainai—large multiplex, brick red with yellow centre, mid-August.
Kishinena—large double, white, early September.
Kootenai—large double, apricot, late August.
Sarcee—large multiplex to double, rust red with yellow centre, late July.
Peigan—medium double, brownish with golden flecks, mid-August.
Kananaskis—medium double, bright deep yellow, early August.
Waterton—large quill (Rayonnate), light mauve, mid-July.
Akimina—large semi to double, bright mauve, mid- to late August.
Paleface—large double, pale yellow, mid- to late July.
Palamino—large, duplex to multiplex, buff, mid- to late August.
Metis—large duplex to multiplex, yellow buff with off-yellow centre, mid-August.

1963 Releases:

Abbe—2¾-inch white flower with yellow centre. Starts blooming in early August. Erect growth. Exceptionally brilliant in color, having no tendency to discolor with age. Excellent cut flower and effective for border planting. Height 25 inches.

Aceena—2½-inch bronze-apricot-colored flower, having a tendency to fade with age. Starts blooming in early August. A sturdy, compact plant. Excellent for border planting. Height 20 inches.

Ahnasti—3-inch pink-mauve flower that does not fade Starts blooming in early August. Erect growth. Excellent for border planting. Height 26 inches.

Beckee—2½-inch white flower with small, yellow button and somewhat frilly petals. Starts blooming in late July. Compact but has a tendency to spread. An excellent early border white. Height 20 inches.

Beckethon – 2½-inch pompon-type flower, pink-mauve, non-fading. Starts blooming in early July. An upright plant with a tendency to sprawl with age. Excellent for cut flowers or border planting. Height 27 inches.

Enee—2¼-inch fuchsia-pink flower that is non-fading. Starts blooming in mid-July. Erect growth, mass-blooming, exceptionally suitable for pot or border planting. Height 15 inches.

Kokanee—2¾-inch pink-fuchsia, non-fading flower. Starts blooming in early August. Erect plant, excellent for cut flowers and border planting. Height 29 inches.

Manie—1¾-inch light purple-colored flower, tending to fade with age. Starts blooming in late July. Erect plant, excellent for pot or border planting. Height 16 inches.

Moeis—2½-inch old rose in color and non-fading. Starts blooming in early August. Erect growth but tends to sprawl later in season. Excellent for cut flowers and border planting. Height 28 inches.

Nootka—2½-inch dark apricot, non-fading flower. Starts blooming early in August. Sturdy erect growth. Best cut-flower type yet produced by the Lethbridge Station and an excellent border type. Height 35 inches.

Above—Garden at Hope, Alaska, on Cook Inlet.
At left—Experimental corn planting in Tanana Valley.

Gardening in Alaska

by **RICHARD H. WASHBURN**
The Washburn Farm and Nursery, Palmer, Alaska

Gardening in Alaska in some ways is different and in other ways very similar to that of the prairie provinces of Canada or the northern midwestern United States except for that portion commonly known as southeast Alaska which is more similar to British Columbia or coastal Washington state. In considering a state the size of Alaska it is difficult to make generalizations so it will be easier to divide the state into several regions considering the more populated areas in greater detail.

Often times the inexperienced individual coming into Alaska may have better success horticulturally than someone with preconceived notions who believes it can be done just as it was in Michigan or Iowa. He is often willing to accept suggestions from those who have learned the hard way. Unfortunately the rack of vegetable and flower seeds at the grocery store is made up for a warmer climate and usually contains few of the varieties recommended by the extension service or experiment station.

Climatic conditions generally govern what is adapted in different areas of the state. Few people who have not been in Alaska have much idea regarding the size or climatic variation found in the state. Southeast Alaska about 58° North has a growing season of approximately 170 days with precipitation ranging from 60 to 150 inches and snow 30 to 140 inches. Temperatures range from 90°F. to −15°F. with growing season maximum averages of 60°F. and minimum of 45°F. The Cook Inlet area, where most of the population is concentrated and also contains the *Matanuska Valley* is about 61° North and has an approximate growing season of 115 days with total precipitation of 15 inches about 50 inches of snow and maximum and minimum temperatures of about 88°F. to −38°F. Growing season maximum average 68°F. and minimum 43°F. The last main populated area where gardening is really feasible is generally called the interior and covers a large area including McGrath to Fort Yukon including the Tanana Valley and Fairbanks. Fairbanks is about 65° North and Fort Yukon is just north of the Arctic circle. Precipitation ranges from 6.5 inches at Fort Yukon to 14 inches at Fairbanks. Temperatures range from about 100°F. to −68°F. with a growing season of from 75 to 100 days. Average maximum and minimum in the growing season are

70°F. and 45°F. In spite of these high temperatures frosts may occur when least expected in this area. There are areas as far north as the foothills of the Brooks Range that have successfully grown potatoes and cabbage in a favored site. Hot springs are often favored garden sites and have long been famous for their vegetables.

COMMERCIAL HORTICULTURE

Commercial horticulture at present is primarily concerned with producing well adapted vegetables such as potatoes, head lettuce, cabbage, radishes and green onions and carrots. Lesser acreages of broccoli, cauliflower, turnips, rutabagas, chard, romaine and rhubarb occasionally appear in stores from local production but are more likely to be sold on stands, especially in the Matanuska Valley. The main commercial acreages are in the Matanuska and Tanana Valley areas with only a very few acres on the Kenai peninsula and in southeast Alaska. There are a number of other vegetables grown but they are primarily for home gardens or in the case of tomatoes and cucumbers produced in greenhouses.

Commercial fruit production if it can be called that is primarily small patches of strawberries or raspberries seldom exceeding 2 acres per patch. There are a few apples and cherries sold in the Haines area of southeast Alaska.

At the present time there are about four full time nurseries as well as a number of other individuals or stores selling bedding plants as well as other garden items.

From the Cook Inlet area northward the precipitation is rather scanty except along the coast and if it weren't for the favorable rainfall evaporation ratio relatively little could be done along agricultural lines. May and June are often somewhat dry so that plants have to get along on what moisture is in the soil. In the Cook Inlet area light rains often start in early July continuing until September sometimes making it difficult to harvest grain and potatoes. Irrigation is mainly of assistance in establishing stands and it is sometimes difficult to prove statistically that irrigated crops produce more than non-irrigated. In areas such as Fort Yukon gardening would probably be practically impossible without supplemental irrigation from the Yukon river.

Many people believe that soils freshly cleared should be fertile but in most parts of Alaska there is no so called fertility in native soils. Without the addition of commercial fertilizer gardening would generally be impossible. Organic matter is slow to break down in our cold soils and if a large amount of compost is incorporated additional nitrogen should be added or all that is present will be utilized by soil microflora in breaking down the organic matter leaving little in way of nutrients for the crop.

Alaska gets a lot of publicity about oversize cabbages up to 50 pounds or more as well as 10-foot high delphineums. This is characteristic of any area with extreme day length combined with low evening temperatures and warm days. So far we have relatively few insect and disease problems compared to more developed areas. We have many of the virus vectors including species of aphids and leafhoppers that are known vectors in other areas but evidently the inoculum is lacking. Our main consistent insect problems as far as horticulture is concerned are turnip maggot, cutworms, red turnip beetle, and numerous species of aphids, leafhoppers, thrips, spring tails and mites. Most of the others are of a sporadic nature.

GARDENING IN THE INTERIOR AREAS OF ALASKA

In the Tanana Valley horticulture has been carried on longer than in much of the Cook Inlet area due to early settlement during the gold rush days. In

addition to the vegetables listed in the discussion of commercial horticulture are grown beans, peas, parsnips, kohl rabi, brussels sprouts, summer squash and for those in a more favorable site early tomatoes and corn is produced by a very few. The use of clear plastic around the base of the plants will make this a more certain crop. Continuous perma-frost does not occur even in the Tanana Valley except on north slopes. The clearing of some north slopes has resulted in production of small caverns where ice pockets have melted which produce holes that can mire farm equipment.

Transplants are used more extensively by commercial growers in this area than in other parts of Alaska. Otherwise commercial practices are much the same.

In the Tanana Valley as well as in other areas potatoes are in some ways easier to produce than in the south 48. So far no sprays or dusts are required for control of foliage insects and disease anywhere in the state. Varieties most commonly grown are Green Mountain, which is sometimes called Arctic Seedling, Kennebec and limited areas of Alaska 114 and others. Long tap rooted carrots such as Imperator are apt to be crooked in these cold soils. The hot spring areas are an exception and a skilled gardener may produce a great variety of vegetables in a succession of plantings.

FRUITS

In the interior tree fruits are almost restricted to bird cherry and siberian crab. None of the named varieties of Malus have survived successfully. Bush fruits are better adapted. A number of raspberries do well including Latham and Chief. They all have a deficiency also found in other areas of the state and that is the production of soft fruit which collapses of its own weight in a container if not frozen at once. They are very satisfactory for jam or as a canned fruit. None of the commercial varieties of gooseberry or currant are quite hardy enough but there are wild plants available. None of the cultivated varieties of blueberries are hardy anywhere in the state except possibly in extreme southeast Alaska. The snow cover is more dependable in this area than further south. At the present time the so called Sitka hybrid strawberries are the only generally available really hardy strawberry. They are generally characterized by high runner production, pink to white center, and very soft. They are best eaten fresh or made into jam. It is expected that the experiment station breeding program will make well colored firm and hardy strawberries available.

ORNAMENTALS

Annuals. Almost any of the annuals listed in any catalog will do well if set out as transplants. Even zinnias do well in this area of higher temperatures. All but zinnias and one or two others do well further south. Relatively

Left: Trollius in bloom in Matanuska Valley. Pictured at right shows colorful flower border.

few are adapted to seeding out of doors. Among these are sweet peas, nasturtium and calendulas.

Perennials. A number of lilies are well adapted especially some of the ones developed in the prairie provinces as well as some of De Graaf's hybrids. Delphinium, Aquilegia, Lychnis, Veronica, Hemerocallis, Iceland Poppy, Pyrethrum and Campanulas are the best known of the satisfactory genera.

In addition to the woody trees listed previously are white birch, Mountain ash, Alder, Tamarack, white spruce, black spruce, quaking aspen and Japanese elm. Shrubs: Dwarf arctic birch, siberian pea, pigmy caragana, Peking cotoneaster, bush cinquefoil, ural false spirea, tatarian honeysuckle, villosa lilac, Preston lilac, oriental spirea, American cranberry bush, Prunus japonica and several low growing junipers. Roses: Certain rugosas such as Hansa, Wasagaming and a few others; Altai or scotch roses and Therese Bugnet. All of course must be on own roots.

COOK INLET AREA

The more moderate climate allows a greater variety of some types though in part some areas have a less dependable snow cover which limits the dependability of certain perennials and woody materials. The Matanuska Valley is especially subject to strong winds and resulting desiccation and loss of snow cover in winter. The Palmer area is usually 5° colder in winter and 5° warmer in summer than Anchorage. Temperatures are much milder in winter than in the interior. The greatest agricultural development has occurred in this area. The natural cover is primarily birch and white spruce and this has been cleared to produce the agricultural lands of the area.

As in the other areas a large number of homes have small greenhouses and most homes have either a flower bed or garden or both. Greenhouses are usually started in early spring for production of bedding plants and during the summer and early fall are used for production of tomatoes and cucumbers. Since very few greenhouses are used except in the summer there is little problem with greenhouse insects and disease compared to areas in which they are used continuously. Considering the high costs of shipped in produce a garden or greenhouse is a worthwhile proposition.

Vegetable production is much the same as in the interior areas except that use of clear plastic to warm the soil and get seeds out of the ground earlier is especially helpful here in the case of beans. Corn will often produce ears if grown through clear plastic.

TREE FRUITS

Quite a large number of crab apples both edible and ornamental types do well if on the correct root stock. In some areas large fruited forms such as Heyer 12 and Red Van Buren produce good fruit in favorable seasons. Hopa, Almey, Dolgo, Rescue, Silvia, Strathmore, Osman, Anaros, Jacques and Dauphin all produce well most seasons. We seem to have no problem with either fire blight or lime induced chlorosis. The ussurian pear, siberian apricot and American plum live through the winter but whether they will ever bloom or produce fruit remains to be seen. Plum-cherry hybrids have done poorly. Choke cherry and bird cherry do well but the sand cherries die to the snow line.

BUSH FRUITS

A number of raspberries including some varieties listed above do well. Several of the Canadian varieties such as Boyne and Madewaska have come through one winter in good shape. There are no really satisfactory strawberries except the Sitka hybrids due to variable snow cover. Mulching often

results in excessive loss due to mice, fungus and other difficulties so that loss may be greater where mulched in conventional manner. Ogallala seems to be nearest to a hardy commercially available variety.

Currants and gooseberries are generally all satisfactory except for white currants. Black currants do especially well although not many Alaskans are familiar with them. Many of the berries are so late in maturing that many are damaged by fall frosts before all are mature. Raspberries and strawberries were still available in October this year. Saskatoons are an excellent crop and help take place of blueberries which are variable as to quality and quantity in the native habitat.

ORNAMENTALS

Annuals: Almost all annuals except zinnias do well as transplants. Asters are especially fine due to lack of aster yellows virus.

Perennials: Bulbs. Tulips, daffodils, lilies of certain varieties and species do very well. Peonies both Japanese and ordinary types are long lived. Hemerocallis except evergreen types. Siberian iris and similar types. Fancier types of rhizomatous habit are not satisfactory. Aconitum, achillea, oriental poppy, shasta daisy, lupines, Trollius, Centaurea, Primula, bleeding heart, and a number of others in addition to those adapted further north.

WOODY ORNAMENTALS

Trees: In addition to those mentioned previously American mountain ash, northwest poplar, griffin poplar, weeping cutleaf birch, flowering crab, European larch, Siberian larch, Siberian elm, Lodgepole pine, bristle cone pine, green ash and a few others in protected sites such as Colorado blue spruce.

Shrubs: Common lilac, rothomagensis lilac, American lilacs and a few French hybrids in sheltered sites. Common lilac seldom blooms except in shelter of a building. Caragana of several species including little leaf, lorbergi, globe, shagspine, etc. Spirea, japanese, billardi; Prunus triloba, nana, japonica. Redosier dogwood, nine bark, amur maple, douglas maple, tatarian maple, edible berry honeysuckle, Clavey dwarf honeysuckle, Alert thorn honeysuckle, arrowwood, nannyberry, wayfaring tree, mugho pine and several low growing junipers if protected from winter sun. Roses: Many of the rugosas, Betty Bugnet, Altai, Alika, Rubrifolia, laxa, Harison's yellow, Austrian copper, Suzanne, Alysham and others if on their own roots. Rhododendrons and azaleas: Several varieties appear hardy in the proper site but not enough is known yet to make a definite statement as to suitability.

SOUTHEAST ALASKA

Vegetables: Same as in northern areas but land suitable for agriculture is more limited due to location of populated areas on coast adjoining hilly terrain or expense in removal of large trees.

Fruits: Same as in northern areas except more of the large fruited forms such as plums, cherries and apples are satisfactory in Haines area.

ORNAMENTALS

Many of the evergreen trees such as cedars, firs, hemlocks do well in addition to those mentioned previously. Additional shrubs such as rhododendrons are well adapted. Annuals same as above with additional perennials such as fox glove and many primroses. A number of the more tender roses such as some of floribunda and polyantha are satisfactory.

It can easily be seen that Alaska gardening owes much to what has been done in the prairie regions of Canada in development of hardy plant materials.

Gardening in the Far North

by **W. A. RUSSELL**
Superintendent, Research Branch, Canada Agriculture Experimental Farm
Fort Simpson, N.W.T.

Experiments at the Research Branch, Canada Agriculture Experimental Farm at Fort Simpson, N.W.T., have demonstrated that in the southern half of the Mackenzie District garden crops grow about as well as they do in more southerly districts of Canada.

The climate of the region is somewhat more severe than that of the southern portion of the provinces. Mean temperature for 17-year period is 24°F with extreme high of 96°F and extreme low of −69°F. Winters are longer with snowfall beginning perhaps two weeks sooner and lasting two weeks longer than at Saskatoon or Winnipeg. Summers start later and are shorter averaging a frost free period of only 91.2 days. The daily length of daylight in summer is progressively longer as one goes north and at Fort Simpson there is a period from the end of May until early in July when the sun never recedes far enough below the horizon to stop photosynthesis. In comparison at Lethbridge the hours of photosynthesis reach a maximum of about 17 per day. The average precipitation is almost fourteen inches but it varies from a low of 9 inches to a high of 18, so drought can be a problem. Generally the long days compensate for the shorter growing season and the moisture is sufficient for good crop growth.

To give an idea of just how well gardens will grow in the north a few notes will be taken from the Experimental Farm at Fort Simpson. Speaking first of Ornamentals we find that paper birch, white spruce and larch from native stands make excellent ornamental and shelter trees. Add to these the European Bird Cherry, Hawthorns, Caragana and a wide range of Poplars which have been introduced. Little success has been achieved with elms or maples. Although very hardy the green ash grows very slowly. Native shrubs include dogwood, eleagnus, shepherdia, currants, viburnum, sorbus, and potentilla and are supplemented by introduced lilacs, spireas, roses, cotoneasters, honeysuckles and several others so that there are plenty of shrubs available for landscaping purposes in the north. A wide array of perennial flowers are hardy. The delphinium because of its outstanding growth and beauty might well be called the flower of the north. Peonies, lychnis, columbines, baby's breath, lilies, pinks and many others have proven to be hardy here. Most of the half hardy annuals also grow and bloom well. Lawns here are about the equivalent of lawns elsewhere in Canada.

Indian trapper's garden at Jean Marie River, N.W.T.

[R. Styra photo

Cabbage grown in R.C. Mission Garden, Fort Smith, N.W.T.

Experimental test plot at Inuvik, N.W.T.

Ornamental test plots at Fort Simpson Experimental Farm

Vegetables belonging to the cabbage family seem to be particularly adapted to the north. Yields of cabbage, cauliflower, broccoli, brussels sprouts and kale are all exceptionally good. Radishes tend to remain crisp much longer in the season than is usually experienced. The root crops carrots, turnips and swedes grow well in the southern part of the region and yields are about the same as expected in southern Canada. The seeding of the main crop for storage has to be as early as possible. Peas and broad beans grow and yield well each season but green beans are sometimes arrested in growth by cool temperatures and fail to mature. Further north at Norman Wells beans fail almost every year. At Fort Simpson potatoes grow equally as well as they do in most commercial production areas, although a July frost has on one occasion completely destroyed the crop. Tomatoes grow well in most years but rarely ripen more than a few of their heavy crop of fruit. The remainder are either ripened indoors or used for pickles and relishes. Even herbs do well in most years.

Native fruits are so plentiful that it is hardly necessary to grow them in the garden. However well the native fruits grow it is nice to know that a number of garden varieties have been tried and have been very successful. Strawberries, raspberries, red, white and black currants and gooseberries have produced abundant crops each year with little attention to management practices. Sand cherries produce each year but usually fail to ripen before frost. Mongolian cherries produce fruit most years but have not been grown extensively.

Two New Ornamental Crabapples

by **W. A. CUMMING**
Research Officer, Ornamentals
Canada Department of Agriculture Experimental Farm, Morden, Man.

Garry and Selkirk crabapples

Two new varieties, products of the breeding program with ornamental crabapples at the Morden Experimental Farm, will be available to the public from commercial nurserymen on the Canadian prairies this spring. They have been accorded names which are distinctively and historically Manitoban, namely, **Garry** and **Selkirk.**

Both belong to the Rosybloom group of ornamental crabapples distinguished by their reddish flowers and leaves. Both have been under test at Morden for 25 years and more recently at other testing stations on the prairies. They have proved their suitability and hardiness.

Garry is an upright-growing tree, 20 to 25 feet in height, with slender, arching branches. Leaves are bronzy dark red in the spring and fall, medium green with a bronzy cast during the summer. Flower buds are deep maroon opening to medium sized flowers of old rose fading to clear pink. Profuse blossoms are followed by small, rounded, ½ inch fruits which are bright glossy red in color, overlaid with a waxy bloom. Fruits remain firm and colorful well into the winter and unless eaten by birds will persist until spring.

Selkirk is a sturdy, strongly growing tree, 25 to 30 feet in height, with a roundish outline. Its large leaves are reddish at first and later turn to dark green with a bronzy cast. The flower buds are bright purplish red, opening to flat-faced rose colored flowers. The large blooms are mostly clustered at the ends of the branches which gives this variety a distinctive effect. The ¾ inch, oval fruits turn bright scarlet red in early August and remain very showy until severe frost, after which they soften, turn light brown and finally drop in late November.

The popularity of ornamental crabapples for landscape enhancement grows yearly and these two new varieties should prove welcome additions to the kinds now obtainable. Because of its growth habit Selkirk requires more space than Garry to develop its full potential.

A New Look at Ornamental Crabs . . . *Especially Rosyblooms*

by **W. L. KERR**
Superintendent, Prairie Farm Rehabilitation Act Tree Nursery, Saskatoon, Sask.

The early history of Rosyblooms in Canada dates back to Miss Isabella Preston's introductions from Ottawa many years ago. They were named after lakes and were crosses between the red-leafed *Malus niedzwetzkyana* and other *Malus* species. Some had fruit of sufficient size to be of interest. Scugog, a large crab with dark red flesh, and Geneva and Louise, large apples with pink or reddish flesh, were among the many introduced. Most of the introductions were only ornamentals. It appears that all of these disappeared from the Canadian prairie nursery trade. *Malus niedzwetzkyana* is considered tender on the Canadian prairies.

Dr. N. E. Hansen of South Dakota introduced a variety called Hopa which was planted widely in both Canada and the United States. It is still being propagated in the States but has disappeared in the Canadian trade. It was fairly hardy and produced an abundance of bloom which faded and was not as bright as many of the more recent varieties.

During the early 1930's, a large number of seedlings, mostly *Malus niedzwetzkyana* x *Malus baccata,* commenced blooming and fruiting at the Morden Station. Considerable interest was shown in them and good selections were made. Seed from these was widely distributed and planted both in Canada and the United States. Some of the best varieties can be traced back directly or indirectly to this origin.

In the 1930's fruit of the large, red-fleshed apples and crabs, including Geneva, Louise and Scugog, was obtained from M. B. Davis, Dominion Horticulturist, Ottawa. The seed from these fruits, produced at Ottawa, was planted at Morden and a new era and interest in Rosyblooms commenced with the introduction of the Almey variety. Almey was brighter in color and attracted wide attention in Europe as well as in North America.

In the early 1940's seed of some of the better selections at Morden was planted at Sutherland, Sask. Of the thousands of seedlings produced most were used as rootstocks. Several hundred of the most interesting seedlings, from the standpoint of leaf and wood color, were spared the propagator's knife and were lined out for blooming and fruiting in shelterbelts. Some selections were made and the variety Sutherland was introduced. This variety, although the darkest in foliage and bloom of any Rosybloom to date, was not as bright as Dr. Skinner's Rudolph or Almey. It was, however, a young bloomer with hardiness and resistance to fire blight. It requires some pruning or "pinching back" when young to make it more shapely.

Sutherland more than any other variety has created a great recent interest in Rosyblooms. Open pollinated seedlings of it have produced a most interesting collection of ornamentals. Sutherland transmits its dark foliage and bloom color to its offsprings more liberally than any other selection. In stature they range from extreme dwarfs (1 foot at 4 years of age) to tall, vigorous trees. In form, the range varies from weeping to pyramidal. Foliage color varies from greenish to very dark reddish purple. Many have very distinctive two-tone colored leaves. In other words, it is the plant breeders dream for variety and distinctiveness.

Among the many selections, Royalty was named. Although it has been tested only a few years, it appears to be very hardy but its resistance to disease has not been widely proved. The best other selection in bloom in 1963 had fire blight so serious in 1964 that it was discarded. Several other good named varieties become ravaged by this disease which makes them undesirable for extensive planting. We have not observed any fire blight on Royalty here although it has been very serious on such varieties as Jubilee, Japanese Flowering and Rudolph near it. Reports from the United States indicate that it is subject to attacks of fire blight at some locations. The outstanding feature of Royalty is the glossy, very dark reddish purple foliage. The bloom has large wide petals almost purple in color. The stems are long, some over 2 inches long. The fruit is from ½ inch to ⅝ inch in size with prominent calyx and persistent stamens, is oval in shape and has very dark red flesh.

Space does not permit the discussion of all the worthwhile varieties. A few, however, should be mentioned for particular reasons. The variety, Snowcap from the Beaverlodge Station, with a great abundance of bright pink buds and snow white bloom, attracts much attention. It is not a Rosybloom but for contrast and beauty is worth a prominent place. Radiant from Minnesota grows into a strong, upright, healthy and shapely tree with small, bright red, attractive fruits.

It is worthy of note that some Rosyblooms carry their fruits to attract birds and public attention throughout the winter, while others drop their fruits in the early fall. Some varieties lose their foliage early while the foliage of others persists and becomes more colorful after the first frosts.

Looking into the future, we will see a diversified group of ornamentals in the *Malus* family that are tailored for almost every purpose in the landscape. Not only will they be attractive for a week or two in bloom, but more important they will have more pleasing form, foliage and fruits throughout most of the year. Hardy crabs in general are adaptable to a wide range of soil and climatic conditions. They are able to compete with other vegetation. Much time will be required to propagate and grow the new selections to a stage where their form, bloom, fruit, foliage and disease resistance can be evaluated.

White Lilac—Sister Justina

Some of the Newer Worthwhile Shrubs . . .

by **F. L. SKINNER, M.B.E., LL.D.**
Skinner's Nursery Ltd.
Dropmore, Man.

Paeonia suffruticosa — The wild tree *Paeonia* of western China is quite hardy at Dropmore with only snow covering for protection. To ensure that the snow will stay on it all winter it is advisable to cover the shrub with a piece of gunny sacking just before the first snowfall in autumn; this will protect the flower buds from winter injury. The flowers are large and pure white except for a big purple blotch at the base and it has two rows of petals. Flowers before the herbaceous paeonies of the Chinese type.

Dropmore Pear is a hybrid between *Pyrus ussuriensis* and Young's No. 3 Pear. The fruits are edible but still not a first class pear. It is very handsome as a medium-sized flowering tree and is as hardy as a native poplar

Spiraea Snowhite — This quite hardy spiraea is extremely free-flowering and considered by some Dutch nurserymen to be superior to the Van Houtte spiraea which of course is not hardy enough for general cultivation in prairie Canada.

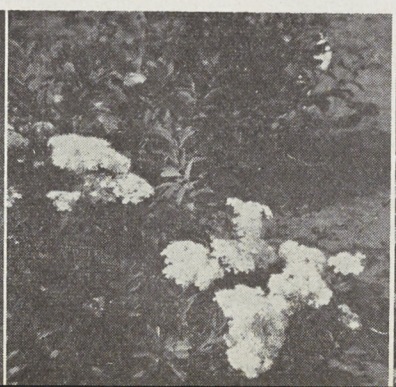
Spiraea Summersnow — This hybrid of the Rocky Mountain *Spiraea betulifolia* has large flat panicles of white flowers in midsummer after the spiraeas like S. *trilobata* have long finished flowering, giving a longer season of bloom in the shrub border; fully hardy.

Syringa microphylla minor — Is a small-leaved, dwarf form of *Syringa microphylla* that reaches a height of only 2 feet in Britain; it makes a neat, rounded shrub that should be much used for dwarf hedges as soon as it becomes better known. It flowers occasionally for a second time in August.

Syringa oblatavar. dilitata — This very fragrant and hardy lilac was introduced to this continent by E. H. Wilson who sent seeds of it from Korea in 1917 and in 1918. I secured plants of it from the Arnold Arboretum; these have proved hardier at Dropmore than many of the European or "French" lilacs. The hybrids of this lilac which I have been raising are known now as the American lilacs. The single, white varieties, such as Mount Baker, the Bride and Sister Justina, are considered the finest single white lilacs in existence today. All are extremely fragrant, start flowering when quite small plants, and do not sucker like the common lilacs. A double white variety of these lilacs

Spiraea Snowhite

Spiraea Summersnow



Philadelphus Purity

which usually flowers from 10 days to 2 weeks before the named forms of the double white forms of the French lilacs, has been called Gertrude Leslie. It and President Lincoln were the two lilacs chosen by the National Arboretum at Washington for Secretary of Agriculture Freeman to send to Poland as a gift from the American people in memory of the musician Chopin.

Buddlea crispa var, Farrerii — The Butterfly bushes grown in the east are not early enough or hardy for our prairie gardens but this near relative from further north in China starts flowering in early August and continues flowering until frost. The bush grows to about 3 feet tall and is covered with 6-inch spikes of lilac-colored flowers. Our original bush though given no protection has flowered freely every year since. It winterkills to near ground level but quickly recovers in spring and soon reaches a height of about 30 inches.

Colutea orientalis — This bladderpod kills to near the snowline in most winters but usually can be counted on to produce freely its large yellow and brownish flowers from midsummer on. Its bladderlike seed pods also are ornamental and in good seasons often ripen their seeds.

Daphne cneorum album — Is a much smaller plant than the pink type and therefore less liable to have the tips of its branches scorched in winters when we have little snow. The pure white flowers are very fragrant, making this one of the choicest dwarf evergreen shrubs for the rock garden; height is about 2 inches.

Genista sagatillis — Is a 12-inch shrublet for the rock garden. The flattened, evergreen leaves act as stems and it has heads of bright yellow flowers in July.

Cytisus decumbens — This prostrate broom is a good carpeter for the rock garden. In July it becomes a carpet of golden yellow, pea-shaped flowers; likes a sunny spot.

Cytisus purpureus albus — Is a procumbent form of the purple broom with very beautiful, pure white flowers. Without protection the tips of the branches may kill back a little but it is very easily protected — just lay a brick or a board on the branches to hold them under the snow all winter.

Genista sylvestris — Is a 6-inch shrublet for the rock garden. It is a miniature gorse or whin bush and has an abundance of the same bright yellow flowers.

Helianthemum — Has two species that are quite hardy, both of which are low-growing shrubs suitable for carpeting the rock garden. *H. appeninum* has greyish leaves and white flowers in midsummer. *H. arcticum* and *H. alpestre* are very similar species with bright green leaves and yellow flowers.

Hypericum kalmianum — Is not considered hardy but we have secured a variety that has proved quite hardy and not only flowers freely but sets seeds at Dropmore. It is a neat little shrub about 15 inches tall.

Lavandula angustifolia — This lavender is a native of the high Alps of eastern France and plants grown from seed secured from this source are quite hardy at Dropmore. The plant could be used as an edging for flower beds in the same manner as the dwarf box is in Europe.

Lonicera pamarica — Is a dwarf, grey-leaved shrub from central Asia. The leaves are quite small, only about a third of an inch across, and in 4 years this shrub has grown only about 20 inches tall. It should make a neat hedge.

Philadelphus Galahad and *Philadelphus Purity* are two hybrids that have been raised at Dropmore. The former is an upright-growing shrub to about 4 feet with a great profusion of spicily fragrant, medium-sized flowers; its leaves are neat, small and glossy. Purity has flowers about the size of Virginal but the bush is a great deal hardier than the French variety and grows about 5 feet tall at Dropmore.

The Prairie Gardener

Gleanings from some of his Sunday Morning CBC chats with the public

Editorial note.

"The Prairie Gardener" is Mr. H. F. Harp of Morden, Man. He occupies the position of Head Gardener at the Canada Department of Agriculture Experimental Farm, and does the plant breeding of herbaceous flowers and of roses and some other woody ornamentals. A favored lifetime of training, travel, reading and doing makes Mr. Harp a most outstanding choice by the Canadian Broadcasting Corporation to prepare weekly garden talks for us, who dwell on the fertile prairies of the Northern Great Plains.

The weekly garden chats come throughout the year on Sunday at 10:15 a.m. Central Standard time. Any gardener who does not listen in is depriving himself or herself of the very finest garden help available anywhere.

The material found here is harvested from some of his recent talks. You will appreciate the way "The Prairie Garden" and "The Prairie Gardener" complement each other. The first aim is to provide the home gardener with useful information. The plant lists made up by Mr. Harp from actual tests in the field are found here in printed form.

WATER is the soul of the garden, without it nothing grows. I've always marvelled at the transformation of a garden when rain comes after a long period of drought. Parched plants revive, the birds sing and all is well.

Water in a garden pool invites quiet meditation and, be it ever so, small, nothing adds greater interest to a garden than a pool.

ROSES. For control of "black spot" I use Captan and for mildew I use Karathane. Malathion and DDT will give complete control of all insects attacking roses, including hard to kill curculio.

During the hot weather it is better to spray your plants at sundown rather than during the heat of the day.

One of the most vigorous of all varieties is Peace, which has been on the go for almost 20 years and is still in first place. Two good reds are Crimson Glory and Chrysler Imperial and two of the most reliable pinks are Picture and Countess Vandal. Sutter's Gold is a fine yellow.

There are scores of others. Some of the best are Charlotte Armstrong, Diamond Jubilee, and Mrs. Sam McGredy. The winner of last year's All American award promises to be a world beater. The color is brilliant orange-salmon and the name is Tropicana.

LILACS. There are hundreds of varieties, many being similar one to the other. A few of the best are Ludwig Spaeth, deep purple; Edith Cavell, a fine double white; Victor Lemoine, with heavy trusses of Lavender-blue flowers; and Charles X, a fine free flowering carmine-mauve.

Newer varieties of French Lilacs include Primrose, a deep cream that is sulphur-yellow in the bud stage; and Esther Staley, a fine pure pink.

The Japanese Tree Lilac and its close relative, the Amur Lilac, are worthy of a place in any garden. Both are hardy and have no bad habits.

CLIMBING PLANTS

Annuals: Sweet Peas, Morning glory, Canary Nasturtium.

Woody: Riverbank Grape, native, to cover fence or pergola.—Virginia Creeper, useful but susceptible to leaf-hopper.—Bittersweet, twines around sup-

port; winter fruit.—Clematis—Western Virginsbower, very durable, white.—Chinese Clematis, fully hardy, bright yellow.—Korean Clematis, pale yellow.—Grace (by Dr. F. L. Skinner) creamy flowers.—Jackman, semi-hardy, large flowers, deep violet-purple.—Nelly Moser and Ville de Lyon, less hardy.

MORDEN LYTHRUMS

Morden Pink, popular budsport, introduced at Morden Experimental Farm, 1934.—**Morden Gleam,** vigorous grower to 4½ feet, many side branches; deep shade of rosy-pink.—**Morden Rose,** erect habit of growth, glossy dark green leaves; flowers bright, rich rose-red, color durable through periods of heat and drought.

Spring planting is recommended for lythrums in prairie gardens.

EARLY SPRING FLOWERS. Bloodroot, Spring Adonis, Siberian Fumitory or Corydalis nobilis, Crimean Irises, "Mossy" Phloxes (Phlox subulata) of which Temascaming is a deep rosy-red variety from Quebec; Primula cortusoides, "Dusty Miller" (Primula auricula).

Bulbous plants: Siberian Squill, Grape Hyacinth, Tulips.

SWEET PEAS. Three strains—Multiflora, Cuthbertson, Spencer.

Cuthbertsons are recommended for the novice and the Spencers for those who wish to grow exhibition blooms and have plenty of water on hand and plenty of time to devote to them.

Cuthbertson varieties—Evelyn, a salmon-pink with cream shadings; Frank G, a fine lavender-mauve; Kenneth, a dark crimson; Ruth, a brilliant rose-pink; Daisy, a pure white.

Spencer varieties—Pinkie, a clear rose-pink; Princess Elizabeth, a soft shade of salmon pink; Powerscourt, a splendid lavender; Black Diamond, dark maroon; Welcome, a brilliant scarlet; Swanlake a large flowered white.

Multifloras, compared to the other two groups, have more flowers on a stem but these are not so large nor so well placed and by the time the topmost flower is open the lower ones are past their best.

NEW DAYLILIES: Chisca, Black Emperor, Minnie, Rose Elegance.

ANNUAL FLOWERS

Marigolds, large-flowered: Primrose Climax, Torreador, Hawaii, Whitey, Alaska. Dwarf or French, small-flowered: Spry, Flame, Rusty Red, Naughty Marietta, Sunny, Redhead. Novelties: Sparky, Dolly.

Salvia: St. John's Fire, Fireball.

Stocks: Giant Perfection Ten Week Stock.

Petunias, Grandifloras, especially useful for window boxes and planters: White Magic, white; Scarlet Lustre and Tango, reds; Prima Donna, rich glowing pink; Maytime and Salmon Magic, softer shades of pink; Blue Magic and Lavender Lace, blues. Multifloras, effective for massing in beds: Red Satin and Commache in reds; Pink Satin, Inca, Coral Satin in pinks; Mercury in blue; Sugar Plum, an orchid blend.

Zinnia, reds—Firecracker, Redman, Trail Blazer; yellows—Golden Queen, Catherine O'Brian; salmon-rose—Rosie O'Grady; lavender and violet; Dream, Lavender Gem.

Snapdragons: Temple, rose-pink; White Spire; Commander, rich carmine; Guardsman, yellow.

Doubles: Super-Jet, yellow; Venus, soft pink with yellow; Highlife, cream and yellow; Vanguard, rose-pink. The Triumph Snaps are about 15 inches high, making them suitable for the front part of the border.

OUTDOOR TULIPS: Paul Richter, Bartigon, Golden Harvest, Nephetus, Clara Butt, Smiling Queen, Queen of the Night, Ivory Glory.

Perennial Gypsophila: Rosy Veil and Bodger's Variety have proved hardier than Bristol Fairy in trying winters. Very useful in the border.

LILIES, for shade: Martigons or Turkscap in such varieties as Brocade, Guinea Gold, Black Prince.

Some that are easily grown; Monadelphum or Caucasian, the earliest variety; Amabile, Concolor, Pumila or Coral; Dauricum or Candlestick, Edna Kean, Grace Marshall, Apricot Glow, Nubian; Henry, the latest of all in season.

Patterson Lilies: Lemon Queen, White Gold, White Princess, Edith Cecilia, Rosalind.

Skinner Lilies: Scottiae, Lemon Lady, Dunkirk, and others.

This is a partial list of the many good lilies that are thriving in prairie gardens.

DWARF EVERGREEN CONIFERS:

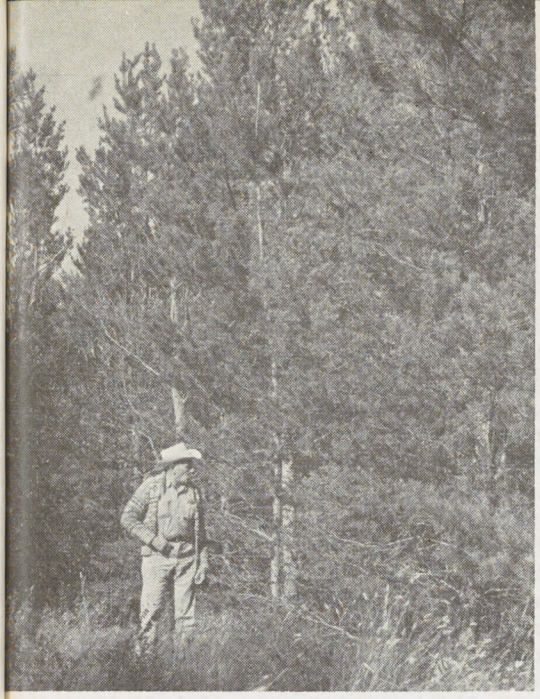
Spruce: Mawell and Birdnest or Ohlandorffi are forms of the Norway; Montgomery is a dwarf Colorado.

Pines: Plumosa, a dwarf Scotch Pine. Dwarf Mountain Pine or Mugo, in select strains with short needles.

Thujas or "White Cedars": Little Gem, Wares, Brandon Pyramidal.

Junipers: Skandia, Arcadia, Savin, Prostrate or Creeping Juniper in Variety.

VEGETABLES for transplanting: Onions—Ailsa Craig, Fiesta. Lettuce—Slobolt, Bibb. Vegetables for the home garden: Radish—Cherry Belle, Bikini. Beets—Detroit Dark Red, Ruby Queen. Carrots—Golden Belle, Early Scarlet Horn, Golden Spike. Corn—Spancross, Golden Beauty, Carmelcross. Cucumbers—Morden Early, Mandarin. Melon—Golden Midget. Watermelon—Hampshire Midget, Early Canada. Rhubarb—Canada Red, Valentine, Macdonald. Annual Herbs: Parsley, Dill, Borage, Marjoram, Anise, Sweet Basil.



Many of the pines are now 20-25 feet high.

Below—New seedlings are healthy and vigorous.

Twenty-eight Years Later . . .

A REFORESTATION EXPERIMENT NEAR KINDERSLEY, SASK.

by ROSE JARDINE, Oyen, Alta.

Mrs. Jardine, née Rose Ducie, was women's editor of the Western Producer for some years and still writes a garden column for this publication. She has been active in press circles for years, being a past president of the Canadian Women's Press Club.

There's an interesting pine grove in a community pasture not far from Kindersley, Sask. D. R. Robinson, extension horticulturist at the University of Saskatchewan, first told us about it and sent us to W. H. Howes, secretary of the rural municipality of Kindersley, for information. Mostly the pine plantation and the reason it was put there has been forgotten, but not by Mr. Howes.

He reminded us of the pine forests in Scotland, Sweden and Germany and the fact that in Europe the Scotch pine is one of the important timber trees and grows to a large size on even comparatively poor soils. He told us about the evergreen forests that are now on the sandhills of Nebraska where in 1902 only a half dozen natural pines were growing.

Mr. Howes was one of the prime movers in the experimental planting back in 1936. A total of 104,785 broadleaf and 16,480 evergreens were planted on 10 acres, northwest of Kindersley. The soil there is a light sandy loam but free from alkali which evergreens do not like. The trees were planted with a shovel in the bottom of a plowed trench, 4 feet apart in the row, rows 5 feet apart. Close planting, but this was not an experiment in shelterbelt or ornamental planting but an attempt to see if a pine grove could be established that would produce forest conditions and then reseed itself.

No further cultivation has ever been given the plantation but it was immediately fenced to give protection against livestock and rabbits. The young trees were obtained from the Forest Nursery Station at Indian Head and had been two years in the seedbed and four in the nursery row.

It was dry in 1936 and again in 1937 but the depressions must have caught whatever moisture there was and the dead Russian thistles formed a ground cover. Then in 1938 the rains came.

What has happened to the pine plantation in the quarter century? Have the pines survived? Have forest conditions been created and are young pines growing from seed? My husband and I went to see. Many of the broadleaf trees, planted to the south and west, have gone after serving their purpose as a protection for the young evergreens. Some of the pines died and some replanting was done but Mr. Howes estimated survival at about 70 per cent.

Many of the pines are now 20 to 25 feet tall. On the north and east near forest conditions have been created. Pine needles cover the ground, the tall trees provide shade and where there are hollows in the ground moss grows on the little slopes that face the north. Where the pine seed fell into the furrows left by the plow—they are still there, even after 25 years—it had the advantage of extra moisture. Many of the young seedlings are growing in these furrows. Some are very young, some several feet tall, and they are growing beyond the fence which surrounds the plantation. According to a report from the Dominion Forest Nursery Station in 1948, many of the trees were producing cones by 1946.

The planting at Kindersley would appear to support the theory that, while there may be some difficulty in getting evergreens started on submarginal lands, once established growth is likely to be steady and the evergreens will survive seasons that will knock out many of the broadleafs. And it appears that forest conditions can be created on submarginal prairie land so that a pine grove can reproduce itself.

When the forest nursery stations first sent out trees for prairie tree planting there was need for wood for fuel. Now, suggests Mr. Howes, prairie horticulturists should be taking a look at the pine as a timber tree for the prairies. There are many species of the Scotch pine and some new ones have been introduced recently that are said to be more resistant to dividing at the top. The red pine has merit and does not sunscald under Kindersley conditions and indications are that it is worthy of an extended trial. It's worth a thought anyway, that if the tree specialist can supply a hardy pine that is a good timber tree, perhaps we have been missing a bet in the search for a more remunerative crop for the prairie's submarginal lands.

Pine grove in commmunity pasture near Kindersley.

The Horticultural Society . . . and the Community

by **F. J. WEIR**
Provincial Horticulturist, Soils and Crops Branch
Manitoba Department of Agriculture and Conservation

Many people have a mistaken idea of what a horticultural society should be doing, or the reasons why a horticultural society has been organized. Many are afraid of the term 'horticultural society', thinking that it is a group of people with long hair meeting periodically to discuss, using Latin terms, plants which may or may not have anything to do with their own area or country. And then there are some who see the report of the list of winners in the horticultural society's annual show and assume that the members of a society do nothing except compete for prizes. Unfortunately, the public are partially right in such thinking.

The main function of a horticultural society is to encourage the development of gardening in its area, by making surroundings more attractive and more livable, not only for the public but for the individual and the individual family. However, the program is much broader and should not end when all home grounds are beautifully landscaped. Each society has additional responsibilities, and the extent to which a society is prepared to go is a measure of the success of that society.

One of the main projects each year in a society's program is the annual show, and rightly so. The horticultural show is the main window through which the public can see what is being grown in the area. Is everything being done to make this show as educational as possible? Horticultural shows are improving year by year in the arrangement of the classes and in the larger numbers of entries in flower arrangements and displays. Much more emphasis should be put on the naming of the varieties exhibited.

Our shows will not be as educational as they should be until exhibitors make a practice of putting the name of the variety on each entry. Perhaps the time is approaching when the prize list should stipulate that all entries must be named. In the meantime, encouragement should be given at all levels for this to be done, and judges should consider correct naming very carefully when judging. A good start could be made by inserting in the prize list a statement such as "Correct variety naming of the entry will be considered in judging." When the ultimate is reached and all entries display the correct names, it can truthfully be said that the show is fully educational.

Another project for most societies is the Home Grounds Competition. Of course the final goal in a home grounds competition is to have all the home grounds in the area included in the competition and all fully improved and adequately maintained. Although the number of improved home grounds has grown substantially, there still are a considerable number of urban lots or farmsteads with little or no landscaping. Many homeowners have to be convinced that landscaping and the improvement of their home grounds, and the development of areas for family enjoyment not only will enhance the value of their property but will contribute greatly to better family living, and will provide absorbing hobbies for family members.

One of the criticisms levelled at horticultural societies is that many of the members are rather elderly, and perhaps not too active. Perhaps this criticism is warranted, but it must be emphasized that all ages of membership are needed. The senior members can contribute from the wealth of experience

that they have had. The younger folks who are establishing their homes and developing their yards have much to gain. Encouragement given to younger and newer members, and the co-operation of all in community improvement, provide the spark for a good horticultural program.

Many horticultural societies are centred in areas where there is a public library. Many horticultural reference texts and many gardening periodicals are available at the present time. Often it is not necessary for these to be purchased by individual gardeners, but if one copy or subscription can be donated by the horticultural society, it can be used by all the members of the community. Some societies already are following this practice.

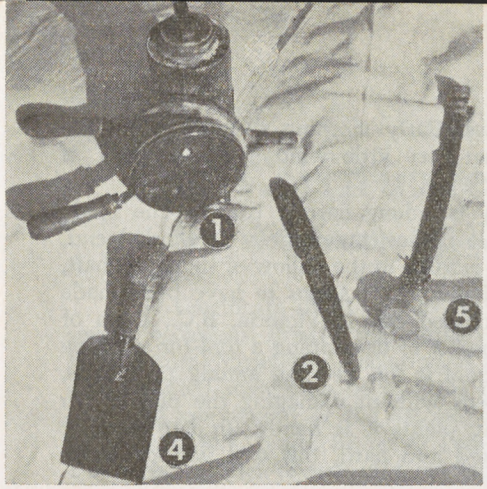
Another practice followed by a few societies is the provision of flowers for decorating churches and other institutions throughout the summer season when there are so many flowers available. There is no limit to the projects of this type in which an active society can be engaged, if the members are really interested in helping their community.

As well as these projects, most of our societies are assisting in whatever way possible in the plans for celebrating Canada's centennial. The majority of our societies in Manitoba already are busy in the development of a park or in the renovation of an existing park. This is one project in which a horticultural society can make a substantial and lasting contribution to the community. Most societies have members who are well qualified to give assistance in an advisory capacity for these undertakings.

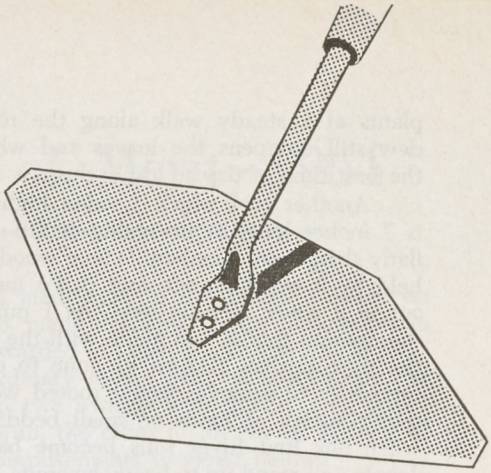
A society also can be of assistance to municipal governments in planning and planting of streets and boulevards and in the planting around civic offices, cemeteries and hospital grounds. In this regard, the assistance and participation of the local nurseryman should be encouraged.

Boulevards on streets of many urban centres were planted 50 to 60 years ago when the Manitoba maple or box elder was the main tree recommended for this purpose, chiefly because of its hardiness. At the present time many of these have reached the stage where they should be removed and trees of other species planted. The cost of doing this in any one year for many communities would be prohibitive. But if each town could do this in stages, a street or two each year, the expense would be spread over several years and in a 10- to 12-year period, the new trees would be providing shade. In encouraging such projects, horticultural societies are truly developing a living memorial as well as providing a distinctive service to the community.

A really active society has a number of projects underway and thus more members are given duties and work is spread around. Societies that are active and have a full program do not have to go begging for members—the members are there. All that is needed is a program that is interesting, helpful to all members, and performing a service to the community.



1—Duster
2—Tapered Trowel
4—Small Spade Tool
5—Sprinkler



Manitoba Hoe
(9" x 5"—one inch at ends)

Garden Tools

by **J. R. ALMEY, B.S.A., Winnipeg, Man.**

Mr. J. R. Almey is one of our outstanding western horticulturists. He was the first Provincial Horticulturist in Manitoba, before going to Canadian Pacific Railway, first as horticulturist then as General Agricultural Agent for the Western Region. He has handled many responsible public positions with distinction, to name a few: President Manitoba Horticultural Association, Canadian Gladiolus Society and Winnipeg Gladiolus Society; Chairman, Ornamental Section, Western Canadian Society for Horticulture. Now retired he tends his Winnipeg garden and his farm at Libau on the shore of Lake Winnipeg.

Garden tools, when carefully selected and used for the specific purpose for which they were intended, can ease the amount of manual labor that all gardening pursuits entail. One comparatively new tool, the rotary mower, has changed the whole concept of country lawns.

We frequently see large lawns, bordering on acreage, beautifully maintained the summer through, whereas 20 years ago they were the exception rather than the rule. Many of us can readily recall the cantankerous reel mower which every chip and stick would bring to a stop; and how quickly it would bog down in tall rough grass. Perhaps the perfecting of the small gasoline engine contributed to the production of a machine that is priced to meet all pockets. The latter applies to the small powered garden cultivator which allows us to plant in close rows and yet reduce hand weeding to a fraction of what it was previous to 1955.

Over the years, many of us who have been gardening for half a century have picked up the odd hand tool which we have used most seasons and valued more and more as our backs lost their suppleness, and time for gardening became precious. In the control of insects and the diseases of our garden plants, insecticides and fungicides are now readily obtainable, but equipment to apply such materials leaves a good deal of room for improvement. For time saving and ease of application I favor dust as against liquids.

One of my most valued tools is a duster which works from a bellows, producing an air stream as did the blacksmith's bellows or the one used to hasten a dull fire in the old-fashioned fireplace. For dusting rows of cabbage, potatoes or gladiolus one can make a good covering of dust on the

plants at a steady walk along the rows. Early morning dusting, while the dew still dampens the leaves and when very little wind is encountered, is the best time of day to apply dusts.

Another tool which I value highly is a long narrow trowel. The blade is 7 inches long, at its widest width 1½ inches, tapering to a rounded end, flatly sharpened. The handle is of wood, cradled in the hollow of the steel shaft, held by 3 wood screws, and is 4½ inches long. It seems to have been made out of a sliver of tube steel. As I purchased this in Victoria, B.C., I am of the opinion that it was made with the object of developing a tool for weeding the rock garden. I know of none to equal it for weeding among perennials, especially to remove deeply rooted weeds without damaging the plants. For spot planting of bulbs or small bedding plants it is handy. In late summer when our Red River soils become baked and hard, this tool will penetrate deeply and stand up to heavy leverage.

A special hoe, known among a few Manitoba gardeners, is the Manitoba hoe, first developed by the late Harold Orchard of Miami, Man. This hoe has seven cutting edges, and the handle is bolted or riveted to the centre of the cutting plate. I do not know of any hoe that will cut weeds slightly below the ground surface with as little effort as this one does. It will cut with a forward thrust like the Dutch hoe, and towards the operator like the common ordinary hoe. One can get very close to the growing plants without injuring them, and the method of attachment to the handle allows a full view of the work being done. It does a more finished job under shrubs and among perennials than a hoe with one cutting edge.

In past years I have had occasion to sow many rows of tiny seeds in cold frames in very finely prepared soil, and seeded very shallow. Kneeling on a wide board which fitted closely into the width of the cold frame, the straight edge of the board became the garden line for the rows of seeds. To open the shallow furrow quickly and at a uniform depth the spadelike tool No. 4 was found to be a most efficient helper. The blade is 4½ inches wide and about 7 inches long. The rather out-of-the-ordinary handle is made of a single piece of wood. The angle this handle bears to the blade helps to lift out the soil or cut a fine narrow furrow along the edge of the board. It also is an excellent tool for lifting blocks of plants from flats.

There are certain areas in most gardens that require more watering than the general sprinkler supplies. Such special areas or plants have to be hand watered. The greenhouse sprinkler or soaker that can be attached to the hose is a most efficient hand watering device. Within a circular disc 2 inches in diameter are 400 small holes which break up the stream into a fine spray and yet put out a large volume of water in a very short time. Attached almost permanently to a short piece of hose it can be coupled and removed quickly without danger of spoiling the thread of the sprinkler head. It is sturdily made and will last many years.

The handy mechanic or do-it-yourself man can make most of these tools as it is probable that several cannot be found in our stores at the present time.

However, aside from these special tools, there are many excellent garden tools and accessories available to the home gardener, on the market today. Make your selections with care and you will find that they will make your gardening much less arduous and much more satisfying. Buy good tools, keep them in good condition, store them carefully and you will find your investment will pay dividends.

As a result of this brief article the writer hopes other gardeners will contribute a description of the pet garden tools which they have used over the years with success.

The Certificate of Merit–1964

by **D. R. ROBINSON, University of Saskatchewan, Saskatoon**

The Certificate of Merit has been mentioned in the Prairie Garden on several occasions. Briefly, this certificate, made available by the Saskatchewan Horticultural Societies' Association, is awarded to amateur gardeners who have accomplished something beyond the ordinary in the field of horticulture. At the 1964 convention of the association two awards were made, one jointly to Mr. and Mrs. James Fraser of Pambrun, the other to Mr. K. N. Heaver of Baljennie. A brief review of their accomplishments is given below.

The Frasers' first farm orchard was set out in 1929 and contained apples, crabapples, plums and plum x sandcherry hybrids. The results of these early plantings were encouraging and additional fruit trees were planted in 1936, and also in more recent years. Varieties planted in this orchard, at one time or another, include Heyer 12, Rosilda, Goodlands and Rutherford apples; Rescue, Dolgo, and Kerr crabapples; Pembina, Bounty and Ivanovka plums; several varieties of plum x cherry hybrids, and also raspberries, currants and gooseberries. Needless to say the vegetable garden has not been neglected and flowers and shrubs have been planted for home beautification. The Frasers have supported the Swift Current horticultural society for 20 years, receiving a Life Membership in 1963. They have won aggregate awards at the local show on 16 occasions. Further, they have consistently supported the provincial fruit show and won the aggregate trophy at the first Saskatchewan horticultural show in 1961. Mrs. Fraser has received numerous provincial and national awards for exhibits of honey and beeswax. These include trophies from the Pacific National Exhibition, the Canadian National Exhibition and the Royal Winter Fair.

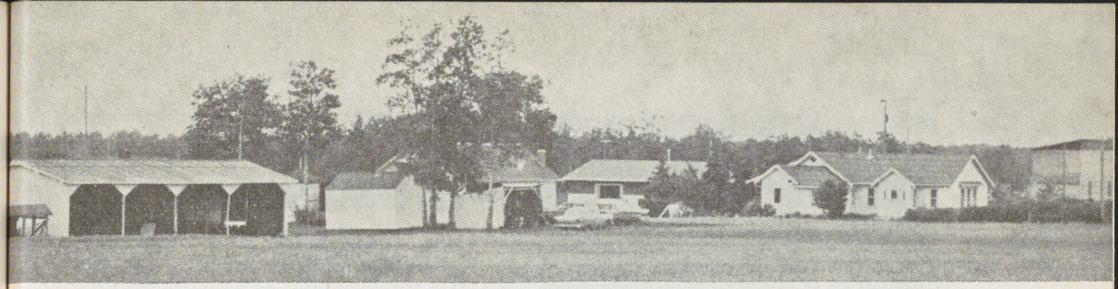
Mr. Ken Heaver was awarded the Certificate of Merit for his unique accomplishments in fruit growing. He has the largest private orchard and is one of the few commercial fruit growers in Saskatchewan. His first orchard, some 6 acres, was planted 20 years ago. In the late 50's a second orchard, 4 acres in extent, was set out; and still more recently his plantings have been increased to a total of 15 acres–a sizeable fruit acreage for Saskatchewan. These fruit trees are planted 20 feet apart each way and the orchard is cultivated with a tractor and tandem disc. The year 1960 was a favorable one and the Heaver orchard produced over 9 tons of fruit. That year returns from the sale of fruit netted $1,400. Details concerning varieties are given elsewhere in this publication. A brief summary is presented herewith. Included in the orchard are 46 varieties of standard apples, 18 varieties of crabapples, 14 varieties of plums, 8 varieties of pears and 5 varieties of plum x sandcherry hybrids. The newest section of the orchard includes a number of the more recent introductions and in particular certain varieties originated by the University of Saskatchewan. Small fruits are represented by 7 varieties of gooseberries, also currants, raspberries, boysenberries and strawberries. A small lot of apricot seedlings fruited in 1964 and some walnuts have recently been planted in the orchard. The Heaver plum x cherry hybrid, as the name suggests, was introduced by Mr. Heaver.

Ken Heaver has regularly supported the provincial fruit show since it was started in 1944. His winnings in this field are numerous and include the T. Eaton Challenge Trophy on seven occasions and one other aggregate award.

With a large farm to operate and a large orchard one might suppose that there would be little time for ornamental gardening but such is not the case. The Heaver home grounds are quite attractive and the plantings include trees, ornamental shrubs, perennial flowers, roses and lilies. Mrs. Heaver takes a particular interest in the home grounds. It should also be mentioned that their married son, Norman, is keenly interested in fruit growing and assists his father in the care and management of the orchard.

The Frasers have demonstrated, in a rather remarkable way, what can be accomplished in the field of gardening in the so-called "dry-belt" of Saskatchewan.

The Heavers might well be described as "modern pioneers" in fruit growing. Undoubtedly these people have set worthwhile examples for others to follow.



The Moore farmstead at Debolt [Alberta Govt. photos

1964 Master Farm Family Award Winners

This year's winners of Alberta's Master Farm Family Award are the Charles Moore family of Debolt and the Ken Burns family of Didsbury, Alta. An excellent blending of the best husbandry practices, family interdependence, community activities and civic responsibility has made these two families worthy recipients of Alberta's highest agricultural award. Their success is the result of careful planning, good management, determination and hard work.

Charles Moore and family have established an enviable reputation in registered grain and forage seed production on their 20 quarter sections of land. Mr. Moore is a "Robertson Associate," the highest award presented to any seed grower by the Canadian Seed Growers Association. He also received a 15-year outstanding service award from the Alberta Seed Growers Association and recognition from the Grande Prairie Agricultural Society for his contribution to agriculture in the Peace River area.

The Burns family, including Mr. Burns' brother Doug, own a section and three-quarters 12 miles east of Didsbury. Half the cultivated acreage is in grain and half in forage. The splendid yields over the years are ample evidence of excellent soil management and good varieties, fertility and weed control. The livestock, comprising 35 head of good breeding cows and 20 brood sows, has been developed to utilize the forage and coarse grains.

The Burns family farm at Didsbury

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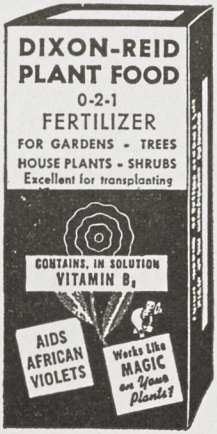

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Plants for Shady Locations

by **W. R. LESLIE, LL.D., Landscape Consultant, Winnipeg, Man.**

The home gardener has the factor of light intensities to consider when choosing plant materials for the various sections of his estate. Often he seeks information as to which plants will comfortably furnish exposures on the north side of buildings, trees, and shrubberies.

The following lists are suggested as candidates:

Ground Covers

Bergenia or Bigleaf Saxifrage
Bloodroot
Blueberry (*Vaccinium*)
Bunchberry (*Cornus*)
Carpet Bugle (*Ajuga*)
Corabells (*Heuchera*)
Daylily
Dwarf Anchusa
Dwarf Yew
Ferns
Forgetmenot (*Myosotis*)
Fragrant Sumac
Goutweed (*Aegopodium*)
Ground Ivy, or Creeping Charlie or Gill-over-the-Ground (*Nepeta*)
Lily of the Valley
Lungwort (*Pulmonaria*)
Moneywort, or Creeping Jenny (*Lysimachia*)
Oregon Hollygrape (*Mahonia*)
Pachistima
Pachysandra or Japanese Spurge
Periwinkle (*Vinca*)
Phlox, Blue Phlox
Plantainlily (*Hosta*)
Primrose (*Primula*)
St. Johnswort (*Hypericum*)
Sandwort (*Arenaria*)
Speedwell (*Veronica*)
Strawberry Saxifrage
Sweet Woodruff (*Asperula*)
Trailing Arbutus (*Epigaea*)
Trillium
Twinflower (*Linnaea*)
Violets (*Viola*)
Virginia Creeper
Wintergreen (*Gaultheria*)

Note—It is recognized that a number of these plants require acid soil.

Window Boxes

Aucuba
Boxwood
Caladium
Dwarf Yew
English Ivy
Fuchsia
Kenilworth Ivy
Little Gem Arborvitae
Lobelia
Periwinkle (*Vinca*)
Tuberous Begonia
Wax Begonia
Wishbone-flower (*Torenia*)

Rock Gardens

Anemone
Aubrietia
Barrenwort (*Epimedium*)
Bearberry
Bergenia
Bunchberry (*Cornus*)
Dodecatheon or Shootingstar
Ferns
Erythronium
Fringed Bleedingheart (*Dicentra eximia*)
Londonpride Saxifrage (*S. umbrosa*)
Moneywort (*Lysimachia*)
Mountain Stonecrop (*Sedum*)
Nevi Stonecrop
Partridgeberry (*Mitchella*)
Phlox
Primroses
Vinca
Violas

Greenhouse: Indoors:

Apostle Plant (*Marica*)
Aspidistra
Aucuba
Chinese Evergreen (*Aglaonema*)
Dracena
Fatshedera
Fiddleleaf Fig (*Ficus lyrata*)
Grape Ivy
Nephthytis (*Rhektophyllum*)
Norfolk Island Pine (*Araucaria*)
Pickaback Plant (*Tolmiea*)
Pothos (*Scindapsus*)
Snakeplant (*Sansevieria*)
Umbrella Tree (*Schefflera*)

Many other plants will tolerate low light intensity but most of them are less satisfactory in dim corners than the above subjects.

Annual Flowers; and Bedding Plants:

Plants require light in order to produce their flower buds in free fashion. However, the annuals mentioned here are credited with performing relatively well in light shade:

Annual Larkspur
Baby Blue Eyes (*Nemophila*)
Balsam (*Impatiens*)
Caladium
Candytuft (*Iberis*)
Clarkia
Cleome or Spiderflower
Cockscomb (*Celosia*)

(*Continued on next page*)

Coreopsis
Drummond Sundrop (*Oenothera*)
Four o'Clock (*Mirabilis*)
Fuchsia
Godetia
Knotweed (*Polygonum*)
Lobelia
Pansy (*Viola*)
Petunia
Phacelia
Sweet Alyssum (*Lobularia*)
Tobacco (*Nicotiana*)
Torenia or Wishbone-flower
Tuberous Begonia
Verbena
Wax Begonia

Herbaceous Perennials

Balloonflower (*Platycodon*)
Barrenwort (*Epimedium*)
Beebalm (*Monarda*)
Bellflower (*Campanula*)
Black Snakeroot (*Cimicifuga*)
Bloodroot (*Sanguinaria*)
Blue Phlox (*Phlox divaricata*)
Bugbane (*Cimicifuga*)
Bunchberry (*Cornus*)
Carpet Bugle (*Ajuga*)
Closed Gentian
Coral Bells (*Heuchera*)
Corydalis
Cranesbill (*Geranium pratense*)
Crested Iris (*Iris cristata*)
Daylily (*Hemerocallis*)
Dwarf Bleedingheart (*Dicentra eximea*)
False Dragonhead (*Physostegia*)
Ferns
Fireweed (*Epilobium*)
Fleabane (*Erigeron*)
Globe Daisy (*Globularia*)
Globeflower (*Trollius*)
Goatsbeard (*Aruncus*)
Goldenstar (*Chrysogonum*)
Grape Hyacinth (*Muscari*)
Hepatica or Mayflower
Jack-in-the-pulpit (*Arisaema*)
Japanese Spurge (*Pachysandra*)
Kenilworth Ivy (*Cymbularia*)
Lily-of-the-Valley
Loosestrife (*Lythrum*)
Lungwort (*Pulmonaria*)
Meadowrue (*Thalictrum*)
Mist-flower (*Eupatorium*)
Monkshood (*Aconitum*)
Plantainlily (*Hosta*)
Periwinkle (*Vinca*)
Primrose (*Primula*)
Red Turtlehead (*Chelone*)
Rue Anemone (*Anemonella*)
Shooting Star (*Dodecatheon*)
Showy Orchis (*Orchis spectabilis*)
Siberian Squill (*Scilla*)
Siberian Wallflower (*Erysimum*)
Snowdrop Windflower (*Anemone sylvestris*)
Solomons Seal (*Polygonatum*)
Sweet Rocket (*Hesperus*)
Tiger Lily
Trailing Arbutus
Trillium
Twinflower
Violets (*Viola*)
Virginia Bluebells (*Mertensia*)
Wild Sweet William (*Phlox maculata*)
Yellow Ladyslipper (*Cypripedium*)
Solomonplume or False Solomonseal (*Smilacina*)

Trees

Few of these monarchs of the plant world like shade. An exception may be the hemlock, a conifer that does not enjoy high-lime soils. Spruce, pine, and balsam fir stand light shade. Deciduous trees that are able to grow in some shade include mountain maple, Tatarian maple, serviceberry (*Amelanchier*), winterberry (*Ilex*), pincherry, and alder.

Shrubs

Many of these lower woody plants tolerate considerable shade and make up the undergrowth in our woodlands. There is variation in the amount of shade that they can grow well in, as observation will reveal. Notable are:

Acanthopanax
Alder
Aronia or Chokecherry
Barberries
Bush Cinquefoil (*Potentilla*)
Clove Currant (*Ribes odoratum*)
Daphne mezereum
Dogwoods in variety
Euonymus
European Red Elder
False Spirea (*Sorbaria*)
Flowering Raspberry (*Rubus*)
Forsythia
Hazel (*Corylus*)
Honeysuckle, Tatarian
Hydrangea, Snowhill
Kalmia
Mockorange
Mountain Maple (*Acer spicatum*)
Ninebark
Oregongrape or Mahonia
Pachistima
Privet (*Ligustrum*)
Saskatoon (*Amelanchier*)
Snowberry (*Symphoricarpos*)
St. Johnswort (*Hypericum*)
Sweet Gale (*Myrica*)
Sweetberry Honeysuckle
Vaccinium
Viburnum in variety
Weigela
White Cedar or Arborvitae (*Thuja*)
Yew (*Taxus*)

Vines, Woody:

Bittersweet (*Celastrus*)
Carrionflower Greenbrier (*Smilax*)
Hop (*Humulus*), largely herbaceous
Moonseed (*Memispermum*)
Riverbank Grape
Virginia Creeper (*Parthenocissus*)

Mushroom units impart a soft downward light to walks and paths, and accent flowers and shrubs

MRS. PHYLLIS THOMSON
Lighting Consultant
Manitoba Hydro

Make the Most of Summer with Outdoor Lighting

Although our Western Canada summers are short, we prairie people have learned to enjoy them to the utmost, taking full advantage of outdoor living while the warm weather lasts. To extend the evenings, to show off our lovely flowers, and to enjoy the summer season as it should be enjoyed—*outside*—we need lighting in our garden and grounds.

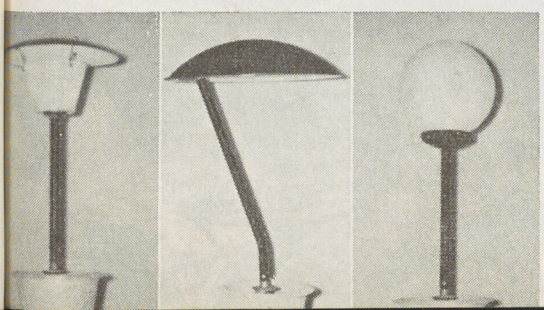
Outdoor lighting can be accomplished inexpensively and effectively with a little careful planning. It allows us to extend and enlarge our homes by lighting patios and porches, and this new concept is fast becoming the accepted mode rather than the occasional showplace. Proper outdoor lighting beautifies the flowers, shrubbery and trees so they may be enjoyed after dark whether we are inside or out. It enables games or barbecues to be continued in the cool of the evening, gives added space for living, and is an important safety factor by helping to prevent accidents.

There are many different types of equipment on the market today. Each particular spot in the garden has a lighting unit specially designed for it, and listed below are some of the various ways lighting may be utilized and the units best suited for each application.

Entrances—Entrances need good lighting to prevent accidents and to project a warm, hospitable appearance to your home. Post lamps, with which we are all familiar, are an attractive way of lighting walks and steps. Another method equally effective is a 150 watt Par 38 floodlamp placed under the eaves of the house, or in a tree, and aimed over the steps. A shield or louvre is necessary when floodlamps are used in this manner to prevent glare. One lamp will illuminate an area of approximately 750 square feet.

There are many types of small lighting units which can be used for walks and paths. These spiked units are available in many attractive shapes and sizes. Some are domed, or in the shape of leaves, tulips or mushrooms. This type of unit blends very well with the foliage. Mushroom units use 25 to 50 watt bulbs and cover an area approximately 16 feet in diameter.

Garden Lighting—When dusk comes and just when our family and friends are home to enjoy it, we lose the beauty of the garden we have worked so hard to attain. Instead of darkness on the other side of that picture window,



Three samples of the small spiked unit: (a) Translucent base with top. (b) Mushroom type unit. (c) Translucent globe

a beautiful vista may be created with a few well-placed lights, enhancing flowers and trees, to make our window, truly a picture window.

The mushroom type of small reflectors mentioned for use in lighting paths and walks may also be used effectively when placed about 18 inches apart in front of low-stemmed flowers, or placed in beds approximately 12 to 24 inches above the flowers. Generally, flowers look better when small-size bulbs of 25 to 40 watts are used.

For overall garden lighting, place floodlamps on your house or in a nearby tree, 12 to 20 feet above ground, and aimed to light the flowers at an angle of about 45 to 90 degrees from the principal viewing angle. For added dramatic effect colored bulbs my be utilized. Grass and foliage is enhanced by green or blue-green light, mercury lamps are especially attractive with blue spruce and birch trees. For the spot where you and your friends gather, tints of warm colors are the most flattering; whereas cool colors will add depth to your garden picture.

Should your garden boast a piece of statuary or if you are the proud owner of a lily pond or fountain, lighting will enhance their beauty. Sculpture may be floodlit from above giving the effect of sunlight, or from below to create interesting shadows. In your little pool, 150 watt Par 38 spots and floodlamps with watertight sockets may be placed under ornamental lily pads. If there is a fountain, a colored Par 38 floodlamp combined with the spray, gives a fairylike appearance and a beautiful focal spot for your garden.

Porches, Terraces and Barbecues—With outdoor lighting, porches and terraces become convenient, extra areas for entertaining, relaxing, and enjoying the view.

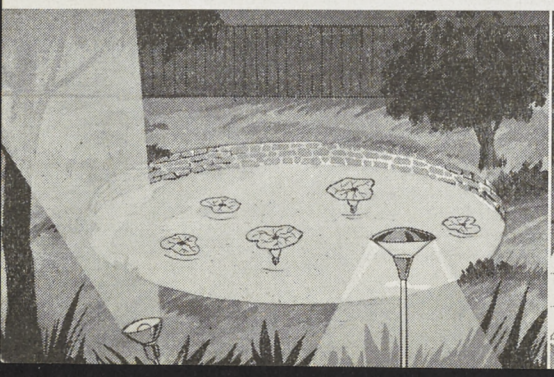
For general terrace lighting, place wall brackets with dome-type reflectors on the house or on walls. For demanding eye tasks such as reading, portable lamps with reflector tops give the best light.

Outdoor barbecues have become very popular the last number of years. Children especially enjoy this form of eating and as it is often difficult to get them inside to meals in the summer, barbecues solve the problem and make eating a pleasure to all.

For the barbecue, at least two floodlamps placed at different locations are needed. They should be from 12 to 20 feet above the ground in a tree, on a pole, or on the side of a building, about 20 feet from the barbecue area. The lamps should be aimed from several directions in order to soften the shadows.

When dining under the trees on a picnic table in the evening, a plastic bubble fixture is excellent. These fixtures are about 10 inches in diameter, and two units with 60 watt bulbs will provide light for a rectangular table

(Left) Because of well-balanced lighting achieved by reflector lights and underwater "lily pad" lights, this pool is as pretty at night as it is by day. (Right) For relaxation on your patio, wall brackets with dome top reflectors direct light downward, and a portable lamp with reflector top gives direct light for comfortable reading



Cooking and dining outdoors is made easy with proper lighting. Diffusing plastic "bubble" fixtures attractively light the picnic table

8 to 10 feet. A 75 watt reflector lamp could also be used in this way. For square or round tables, a large bubble unit 14 to 20 inches in diameter with 100 or 150 watt bulb would be needed. These bubbles can be hung from the branches of the tree about three to five feet above the table.

If you use a round table with a lawn umbrella over it, a 60 watt bulb or 100 watt yellow lamp can be used in an indirect lighting unit. A 75 watt floodlamp in shielding can be placed on the umbrella, directing the light upward to reflect back down. Units designed for this type of application have a clamp for pole mounting. This upward light will be soft and diffused if the umbrella lining is white or near white.

Trees—We must not neglect one of the main sources of beauty in our yards—our trees. A favorite tree may be made the focal point of the whole garden. How a tree is lighted depends on the type of tree and the effect desired.

There are three main methods of lighting a tree. It may be lighted with two or three spotlights or floods, each placed in a different location; or a shielded lamp may be placed at the rear of the tree and aimed upward. The third method is to mount a floodlight at the base or in the tree above eye level. Used in this way the light will shine up into the tree and reflect down from the foliage.

There are many other ways in which lighting may be used to make the summer more delightful for us all. Summer athletes who hate to stop playing just when it becomes cool, find outdoor lighting a boon. Games such as tennis, archery or lawn bowling can be played into the cool evening hours with the addition of floodlamps mounted on poles. Should you be lucky enough to own a swimming pool, these are also lighted with pole-mounted floodlamps. A large pool would use one 150 watt floodlamp for every 45 square foot of surface area to be lighted.

Some mention should be made of wiring, as not only must we have the proper type of equipment for outdoor lighting, adequate wiring is essential. Wiring may be temporary or permanent but permanent wiring makes the installation of lighting equipment easier and does away with the temporary wires stretched across walks and yards.

Spotlight

The versatile Par 38 floodlamp recommended so often is specifically designed for outdoor use and features a special glass bulb that will withstand exposure to rain and snow. The reflector is sealed into the bulb and so cannot tarnish or collect dirt. These lamps are available in both the 75 and 150 watt size.

To minimize visits from those pesty night-flying visitors we all know so well, the best way of course is to spray liberally with a good insecticide, but there is a special yellow lamp which does not attract insects. These yellow bulbs are available in 50, 100, and 150 watt sizes and may be used in mushroom fixtures too.

These are a few ways outdoor lighting will help you to lengthen your summer days and obtain full benefit from your garden. Specific measurements on placing of lights, and detailed descriptions of the different types of lamps and equipment available, may be obtained by writing or 'phoning for the booklet, "Light for Living . . . Outdoors!" to Manitoba Hydro, P.O. Box 815, Winnipeg 1, Manitoba.

Grow Grasses

by **HECTOR MACDONALD, F.R.H.S.**
Winnipeg, Man.

I don't mean the lawn grasses—the blue grasses, the bents and the fescues; or the pasture grasses—timothy, red top, brome or any other fodder grass. I am out to boost ornamental grasses, graceful subjects that add delicate texture to flower beds and borders.

The fruiting spikes of most grasses can be easily cured for indoor winter decoration; either natural or dyed, they are excellent for dried arrangements. In summer, many of the ornamental grasses are ideal as fillers for cut flower bouquets.

There are perennial grasses and annual grasses; all are easy to grow. First, we have two species of perennial grass that are very hardy:

Ribbon Grass or Gardeners' Garters *(Phalaris arundinacea)* is fairly common, with green and white stripes. It grows 2 to 3 feet high nearly anywhere; will fill in a difficult shady spot; fits in beautifully on the edge of a pond or stream; is a wee bit aggressive and tends to spread.

Reed grass *(Phragmites phragmites)*, a tall, handsome plant growing to 6 feet, is found native in Manitoba in damp areas. An improved garden form with large silvery plumes in late August is a striking subject and perfectly hardy; and cut and dried makes fine indoor ornaments. I don't see it listed in any local nursery catalog; maybe this will give them a hint.

We grow some lovely annual grasses, with seed imported from England and sown outdoors where it is to grow. My favorites are:

Cloud Grass *(Agrostis nebulosa)* and well named, is a dainty grass 1½ feet tall. Quaking Grass *(Briza maxima)* has large seeds nodding on graceful stalks, 1½ feet high, and is good for bouquets. Try this one for winter decoration indoors.

Job's Tears *(Coix Lacryma-Jobi)* is an attractive oddity, 2 feet in height, whose large, hard seeds can be strung as beads. Love Grass *(Eragrostis elegans)* is a lovely filler for sweet peas and other cut flowers. It grows about 2 feet high. Hare's Tail *(Lagurus ovata)* 1 foot high; children love the fluffy seed heads.

Last on my list is a half-hardy annual *(Pennisetum Ruppellii)* with a very graceful habit and often used as an edging for canna beds or borders. It should be started indoors. I haven't heard of a common name for this one.

A Garden of Fragrance

by **LOIS WILSON,* Toronto, Ont.**

One of the loveliest gardens in Canada, The Fragrant Garden for the Blind, is part of the national headquarters for the Canadian National Institute for the Blind in Toronto.

This garden was the gift of The Garden Club of Toronto, planned for the pleasure and exercise of the blind who live and work at the Institute; and was planted with trees, shrubs and flowers that have fragrance, an interesting texture or an intriguing sound. It was designed by J. Austin Floyd, M.L.A. (Harv.), who will be remembered by Manitobans as the son of L. T. Floyd, Provincial Apiarist for many years, and is almost an acre in size.

The plan of the garden is set by the rectangular exercise walk where the blind are able to guide themselves with different textures of asphalt, tile and concrete at edges and corners. Auxilary walks to a little formal rose garden and through a shrub planting of Russianolives, flowering crabapples and philadelphus attract the more adventurous. Benches for sitting on in spring or autumn sun or cool summer shade are placed all over the garden.

Raised beds, sheltered by the residence wall and planted with sweetly scented flowers from hyacinths in earliest spring to mats of pink dianthus, stock, nicotine, petunias, heliotrope, and roses, all the most fragrant varieties, a gift from the Colchester Rose Society in England in summer and then pungent 'mums in the fall, make it possible for the blind to find and identify each plant easily. Labels are in both Braille and incised lettering.

The fragrance of pinching plants—the thymes, artemisias, peppermint and rose geraniums, lemon verbena and lavender—scents the summer air. The soft, faintly cucumbery smell of lime trees in bloom is part of the long June evenings. Snapdragons with their fruity smell go on blooming often into December.

For interesting texture, there are little hedges at the ends of the raised beds of polished box, soft woolly rabbits' ears in the *Stachys lanata* and the whitebeam tree *Sorbus aria,* the smooth, porcelain pink flowers of *Magnolia soulangeana* and its leathery leaves and smooth bark, the smooth feel of crabapples in the fall on the little avenue of Cheal's Crimson trees across the west end of the garden. And for the soft sounds of nature, there are the swish of white pine in the wind, the rippling rustle of trembling aspens *Populus tremuloides,* and the singing of the birds who naturally nest in such a friendly garden.

A main feature of the garden is the butterfly fountain, its roof of turquoise fiberglas, the pool centered by the large marble carving, "Sounds Assembling" by Elizabeth Wyn Wood. Water is piped up the flying supports of the butterfly roof, sprays in a cooling mist into the center, and drops with a splashing sound onto the figure below.

The Fragrant Garden, now 8 years old, has proven not only a delight to the blind but a favorite spot for visitors from the city and out-of-town. All are welcome. All will find a fascinating spot from the time the earliest crocuses bloom in late April until the first hard frosts of the late November.

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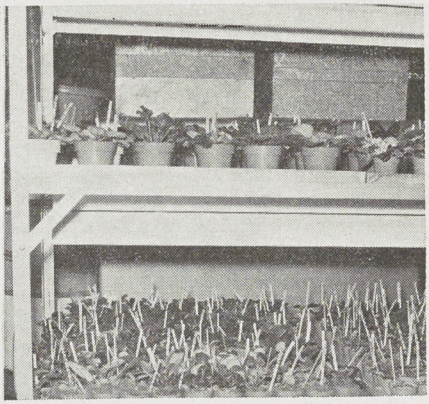
*Mrs. J. R. M. Wilson is known throughout the North American continent for her writings on flowers. Her latest book is titled Miniature Flower Arrangements and Plantings. She is gardening editor for Chatelaine.

African Violet Propagation

(Photos by Joseph A. Jordan)

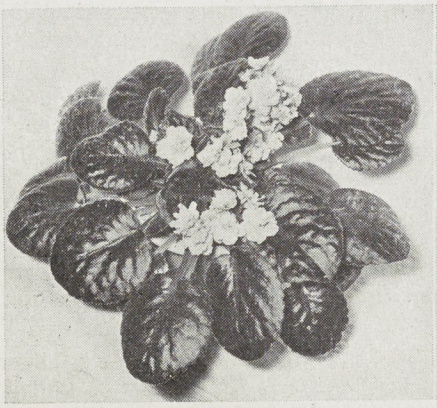
Leaves rooting in vermiculite



Rootings and small plants

Very small plants

Mature plants



Pink Commotion

Fair Elaine

The African Violet "Bug"

by **G. S. REYCRAFT, F.R.H.S., Winnipeg, Man.**

The writer had the pleasant experience of calling on Mrs. M. Peake, 114 Armstrong Ave., West Kildonan, Man., about a month ago. I was so fascinated with the little lady and her wonderful show of African Violets that I just had to return and take a few pictures (see opposite page).

Several years ago, Mrs. Peake was growing a few African Violets in her sunroom. Then the "Bug" must have got her for you can get some idea from the accompanying pictures what Mrs. Peake's basement looks like today. Some 3,000 African Violets contained on trestle tables overhung with 25 2-lamp 40-watt fluorescent fixtures, 19 of them Gro-Lux lamps, the remainder cool white as well as two 3-tier stands containing her smaller plants, fill the entire basement. Polyethylene sheets around the walls to keep out the drafts, a vent in the hot air blower system that heats the house, a humidifier and several open drums, filled with water completes her lay-out.

The beauty of table after table of superb flowering plants was breath-taking. I noticed that all her mature saleable plants were under the soft pink glow of her Gro-Lux fixtures. When she moved one of her African Violets over from under the cool white fluorescents to the Gro-Lux lamps, I could see the reason why. The colors of the blooms immediately took on a much more vivid live appearance. It was so startling that one could hardly realize it was the same plant. The rich green of the foliage was also enhanced.

African Violets are one of the easiest flowering house plants to propagate and grow. They have low light intensity requirements and actually grow better under fluorescent lights than in sunlight because of more uniform conditions of light and temperature. Mrs. Calder, in an accompanying article, gives you a few basic growing instructions. The difference as she puts it is "like baking," when you develop the touch the results are prize-winning plants. Mrs. Peake has proven that she has that touch. Last summer at the Red River Exhibition in Winnipeg her entry "Double Garnet" won the Grand Championship award.

Fruit Introductions by the University of Saskatchewan

The following notes are taken from a progress report of
DR. S. H. NELSON
Head, Department of Horticulture, Saskatoon

In 1959 and 1960 the late Dr. C. F. Patterson named 20 varieties of apples, 8 varieties of pears, 15 of plums and 8 of plum x cherry hybrids.

Dry weather, coupled with close planting of the trees, has not allowed a satisfactory appraisal during the past 4 years. However, in 1962 a new orchard comprising all the varieties was planted at wide spacings and with irrigation facilities. When it comes into bearing fair information will be obtained. For the present some impressions acquired during the 1963 and 1964 seasons are given. Some name changes have been necessary because of previous usage in other locations of the former name.

APPLES: Abbott has not sized well under conditions encountered. **Advance** is one of the more promising varieties. With 60 per cent red wash and harvested just before the middle of September, it sized to about 2¼ inches.

The apples are slightly acid but of very good quality, pleasant tasting and seem to store the best of the varieties tested. **Andersen** has fallen short of the 2 inch mark originally described for it. **Barry** is almost solid red but tends to be small, is yellow fleshed, almost sweet and does not keep as well as some of the other varieties. **Brightness** has not been over 1¾ inches and has a general crabapple flavor, is full bright red and very attractive, medium high in acid and has coarse flesh which tends to brown quickly. **Chipman** with Delicious-type shape and flavor does not mature until late September, lacks somewhat in size and may suffer from lack of winter hardiness. **Dawn** (formerly known as Early Redbird) is a good heavy fruiting red crabapple about 10 days earlier than Silvia. **Exeter** ripens early in September, measured 2¼ inches, fairly well streaked, good dessert quality but soon goes out of condition. **Harvester** (formerly known as Early Harvest) about 1⅞ inches, has about 50 per cent blush, fine white flesh, not very juicy and is mild tasting almost to insipid degree. **Lambton** about 1¾ inches, 50 per cent orange-reddish blush, mealy flesh, not juicy, slightly acid. **McLean** is one of the promising varieties, fruit to 2½ inches, yellowish with light carmine wash, crisp juicy flesh which is slightly aromatic, pleasant flavored dessert apple, ripening in early September and stores about 3 months. **Park** a summer apple, to 2½ inches, mostly covered with bright red wash, acid to mild acid, late August. **Patterson** (formerly called Munro) to 2¼ inches, slight peach colored blush; flesh crisp, juicy, fine, mildly sub-acid and very pleasant tasting; very high quality and keeps about as long as McLean. Considered to be the best quality apple. **Prolific** up to 2 inches, highly colored when ripe in late September. Excellent quality. **Rutherford,** similar to Heyer 12 in fruit, tree and leaf, but keeps slightly longer and superior for cooking. **Winter Queen** up to 1¾ inches, dull red blush, ripens last week of September. No comment on other varieties because of limited observation recently.

PEARS: John and **Philip,** the largest, ranging up to 2¾ and 3 inches in length. **Peter** and **David** have been medium in size, Peter proving best in storage. **Andrew** is early but breaks down very rapidly and is not recommended. Comment on the other varieties is delayed.

PLUMS: Supreme a 2-inch dessert plum completely washed with orange at maturity and has excellent juicy flesh. **Geddes** is very similar but somewhat smaller, ranging to 1¾ inches. **Patterson Pride** a good dessert, red hybrid, tree tending to weep.

Readers will look forward to further reports from Dr. Nelson as fuller knowledge is acquired from the new orchard, favorably situated at the University. It is exciting to know that the varieties of hardy good tree fruits for the prairie home-makers are being substantially enlarged, and right here at home.

BREEDING HARDIER HYBRID TEA ROSES (Conc.)

Wright from a cross of Hansa and *Rosa nitida* and George Will from a cross of *Rosa acicularis* and a floribunda by Dr. F. L. Skinner.

My hybrid probably is a diploid and not fully fertile when crossed with tetraploids. But its value is considered mainly for further breeding rather than for its decorative qualities. A bud lifted from it 12 inches from ground level, before growth started last spring, grew and flowered well when grafted on a potted plant in the greenhouse.

I think results to date are fair proof that much hardier everblooming roses are possible. To get them with as good flower qualities as present-day hybrid teas may take additional time. Many more seedlings will have to be tested before the right combinations are found.

Breeding Hardier Hybrid Tea Roses

by **R. SIMONET, Edmonton, Alta.**

Mr. Simonet is one of the outstanding plant breeders on our prairies. First to develop double petunia varieties on this continent. Has given us many outstanding varieties of roses, gladiolus, hollyhocks, rhubarb and strawberries. Winner of Stevenson Memorial Gold Medal in 1960 for "conspicuous achievement in the field of practical horticulture."

The need for hardier hybrid tea roses is well known but the big question is: Are they possible?

My main work with roses is to try to bring, at least, some higher degree of frost resistance to the hybrid teas by crossing them with very hardy species. Of the four species I have used, two are native to the Canadian prairies, *Rosa acicularis* and *Rosa suffulta,* both with shades of pink flowers; the other two with white flowers or nearly so, are native to the colder part of Asia and Siberia, *Rosa spinossissima altaica* (the Altai rose) and *Rosa laxa.* All four are tetraploids and so produce fertile hybrids when crossed with the similarly tetraploid hybrid teas.

As expected the first generation of hybrid seedlings are only once-blooming and most of them with only semi-double flowers. None are fully hardy and the amount of winter-killing varies widely. Back-crossing of these onto the hardy parent failed to set seeds and selfing was not much more successful. But I find inter-crossing of first generation hybrids from the several hardy species are giving better results. Some everblooming plants I now have, include 2, 3 and all 4 of the above hardy species in their parentage.

Results when *R. suffulta* pollen is used on hybrid teas differ from those of the other hardy species in that some of the first generation seedlings have the same everblooming growth as the hybrid tea parent and show no noticeable trace of *R. suffulta.*

H. H. Marshall at the Brandon Experimental Farm had similar results with *R. suffulta* hybrids and at first thought the cause might be accidental selfing of the hybrid tea parent. Later he suggested that it might be a case of apomixis when seed is formed without the benefit of pollen.

But I am not sure that either is correct since last summer I had two-selfed seedlings of Woodrow (a double-flowered form of *R. suffulta*) each with a flower bud when less than 2 inches high. Could it be that *R. suffulta* carries a gene for everblooming as do hybrid teas? More testing should prove the point one way or the other.

My mixing of the above 4 hardy species with the hybrid teas is producing many interesting plants but none of the better ones have been tested long enough to prove their full value. There are indications that hardier hybrid teas are possible.

The hardiest everblooming plant I have came from a different line of breeding. It is a second generation seedling of a hybrid of Aylsham crossed with George Will. It is now only a 2-foot plant with semi-double, small pink flowers produced throughout the season. It stood the last two winters with very little kill back at 30 degrees below zero. Aylsham is from Percy H.

←——————(*Concluded at bottom of page* 112)

African Violet Growing

by **MRS. N. R. CALDER**
Fort Garry, Man.
Winnipeg African Violet Society

"Once bit twice shy," is an old saying, but this is not always true, because with violets it's, "once bit—you've had it." Violet growing is exciting and can easily become a very satisfying hobby. I started out with just a few single and double blues, but now my hobby has grown into a little business that my son and I enjoy. How fascinating when the first pinks were introduced and then when a pink double came on the scene one was just thrilled. We owe a great deal to our hybridizers for their untiring efforts and so much patience in bringing us so many different color combinations, including our genevas with the white edges, also our lavenders, lilacs, fuschias, wines and so many varieties too numerous to mention here.

Violet growing can be listed under three headings: Starting leaves; baby plants and mature plants. Violets are very easy to propagate and leaf cutting is the most popular method. They can be grown in a medium of three parts vermiculite and one part sponge-rok or perlite. Tiny plantlets should appear within 2½ to 3 months, so one has to have patience in waiting. When the baby plantlets are about two inches high it is necessary to separate them from the mother leaf and plant each one in a 2 or 2½ inch pot with a light soil mixture, preferably 2 parts vermiculite, 1 sponge-rok and 2 sterilized leaf mould. After the first blooming the plants can then be put into a 3-inch pot with your own favorite potting soil and fertilized. I like to fertilize a little every time I water. We use Alginure with a great deal of success, but there are many fertilizers on the market today from which to choose from.

We grow our violets under fluorescent lighting in the basement. Our plants get about 14 hours artificial light per day and lights are about 12 inches above the plants—for smaller plants they can be closer. We use warm white and daylight tubes and Gro-Lux, but find that with the Gro-Lux that the lights should be about 12 to 14 inches above the plants and not kept on so long, say 10 to 12 hours, otherwise they may burn your leaves.

Violet growing is like baking, you need to find your favorite recipe of soil mixture and conditions which suit your special surroundings, and when you find your growing successful just stay with it. Water only when the plant feels dry to the touch and then give a good watering as violets do not like wet feet.

So watch out for the violet "bug," and Happy Violet Growing to you all!

Novice or expert you are cordially invited to attend the meetings of the Winnipeg African Violet Society, a section of the Winnipeg Horticultural Society. Meetings usually are held on the first Wednesday evening of each month, in the auditorium of the Norquay Building, 401 York Avenue, Winnipeg, Man. For further information phone Mrs. N. Calder, 452-6794.

Fluorescent Lights

by **G. S. REYCRAFT, F.R.H.S., Winnipeg, Man.**

Fluorescent lights can in a very enjoyable way help you turn winter into summer in the place you are largely confined during the long winter months – your home.

Fluorescent lights are invaluable in starting your own seeds for planting outdoors later; for starting your tuberous begonias, for starting and growing rooted cuttings as well as for the growing of numerous plants. They can also enhance the beauty and decor of your living areas.

My fluorescent lamps do all these things for me. I have several sets of fluorescent fixtures in the basement laundry room where it is reasonably warm. The units are on chains which can be raised or lowered as required. I grow a number of African Violets in this area as well as during the winter give a periodic boost to the numerous foliage plants we have around the house. In the early spring I use this area to start my seeds, tuberous begonias, etc. A little later my seedlings are transplanted into larger flats and along with my tuberous begonias they go into my workshop in a larger area under another series of fluorescent lamps and finally out into the cold frame or into the garden. I also have fluorescent tubes under a long stand in the living room and in a room divider. Here you will always find a show of African Violets and numerous foliage plants.

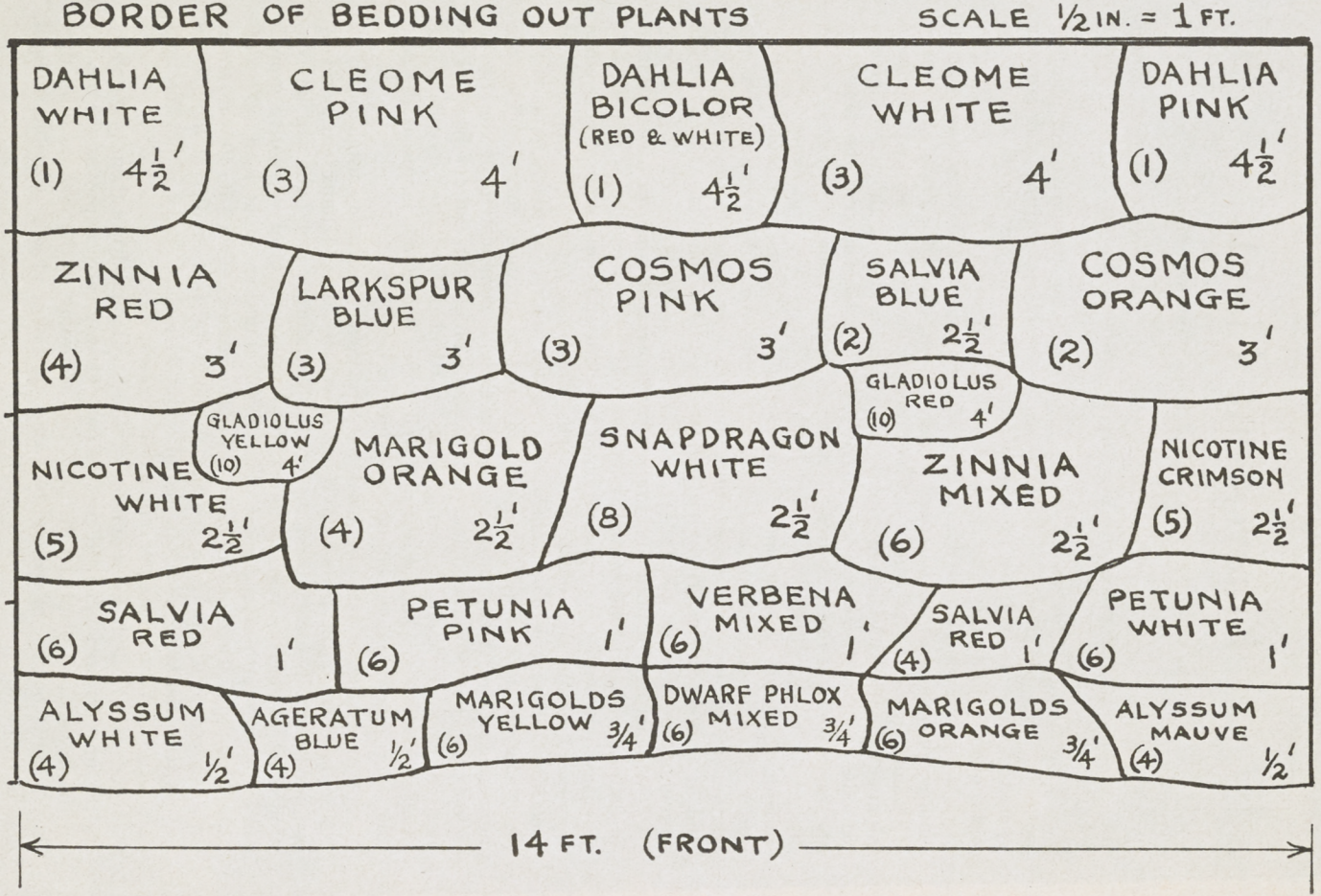
Artificial light is normally supplied by fluorescent lamps or a combination of fluorescent lamps and incandescent lamps. Incandescent lamps provide low intensity light with a high proportion of red light and quite a bit of heat while fluorescent lamps give off approximately 2½ times more light per watt of electricity, abound in blue light with a smaller degree of red light and very little heat. In general, red light causes plants to become "leggy" while blue light causes low stocky growth. Consequently a combination of the two is often used, both for the balance of red and blue light and for heat where needed. However, many flowering plants, particularly low intensity plants like African Violets, are known to grow well under fluorescent lamps as the sole source of light. I suggest either cool-white or Gro-Lux.

Artificial lights may be used in permanent basement installations, or house mounts, or in plant stands or moveable carts. Lamps are normally mounted 6 to 18 inches from the plants. The duration of light can be controlled by an electric timer. In order to get a good rate of vegetative growth of seedlings, cuttings and most plants light intensities of at least 600 foot-candles and day lengths of 14 to 16 hours are required. Two 4-ft. 40-watt lamps in a reflector will supply an average of about 400 foot-candles of light at 18 inches from the lamps over an area of about 24 inches. At 12 inches the light intensity will be increased to about 600 foot-candles.

Recently I purchased a number of Gro-Lux lamps. I like them particularly in the upstairs area where their soft pink glow greatly improves the beauty of the flowers and plants on display. Also according to the manufacturer they give a better balance of red and blue rays, that more closely resemble sunlight and consequently produce more healthy stockier plants.

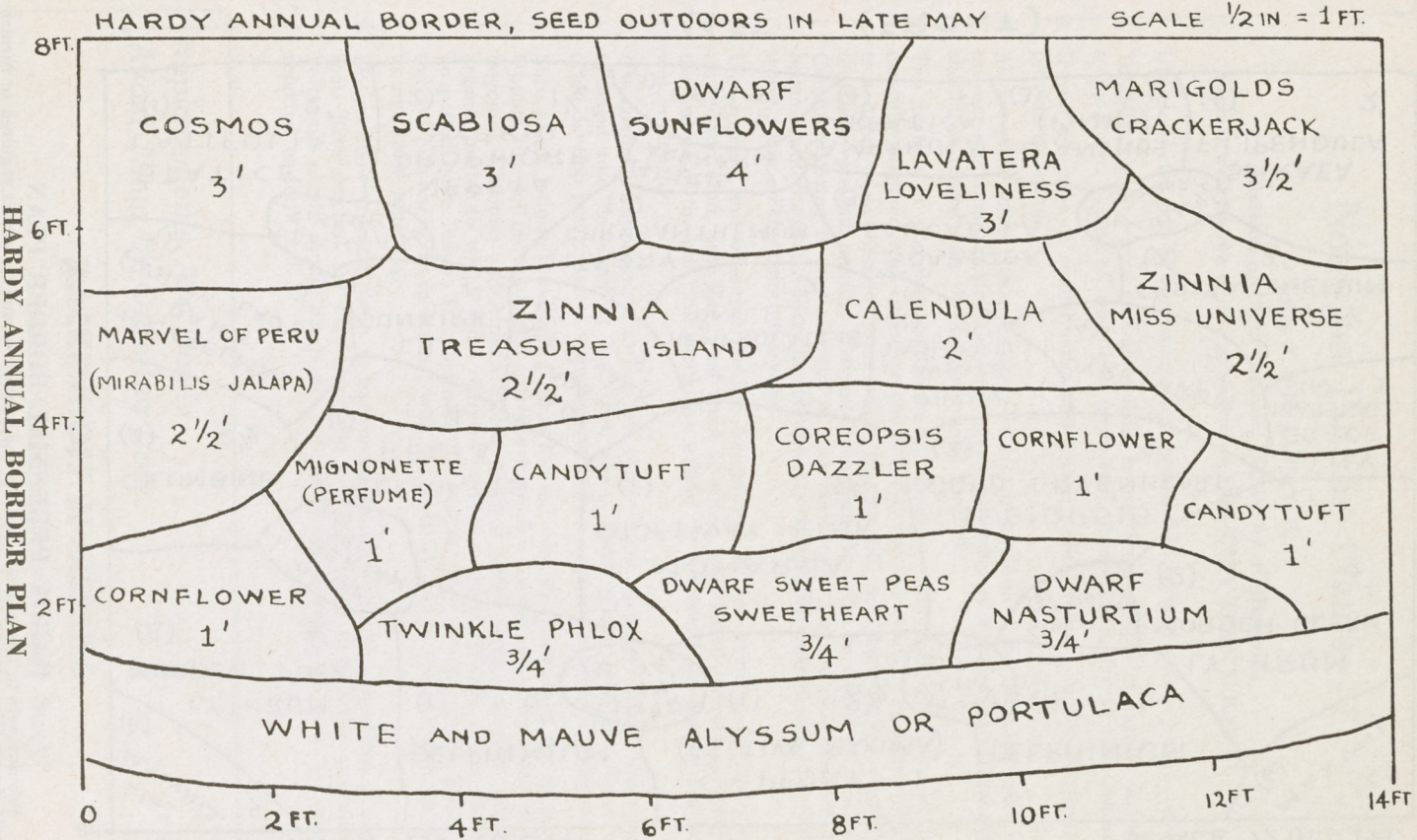
I hope I have said enough to pique your interest. I suggest you turn to your library, your book store, the fluorescent lamp dealer or to the manufacturers themselves. I know you will get all the information you need.

BULLETINS AVAILABLE: Canadian General Electric Co. Ltd., 1. Plant Growth Lighting; 2. Light for Plant Growth; 3. What's Happening to Horticulture? Sylvania Electric (Canada) Ltd., 1. Instructions for using Gro-Lux Fluorescent Lamps.



BORDER OF BEDDING OUT PLANTS

Borders made of transplants are now very popular. This plan indicates height of plants, the number involved, and color combinations. All plants except Dahlias and Gladiolus are started in flats or purchased from nurserymen. Gladioli are included here for their texture and their swordlike leaves. Dahlias add rich colors and height. The whole border is 8 feet deep. Narrower borders can be planned by selecting the items most desired. Hector Macdonald, F.R.H.S., Winnipeg, Man.



HARDY ANNUAL BORDER PLAN

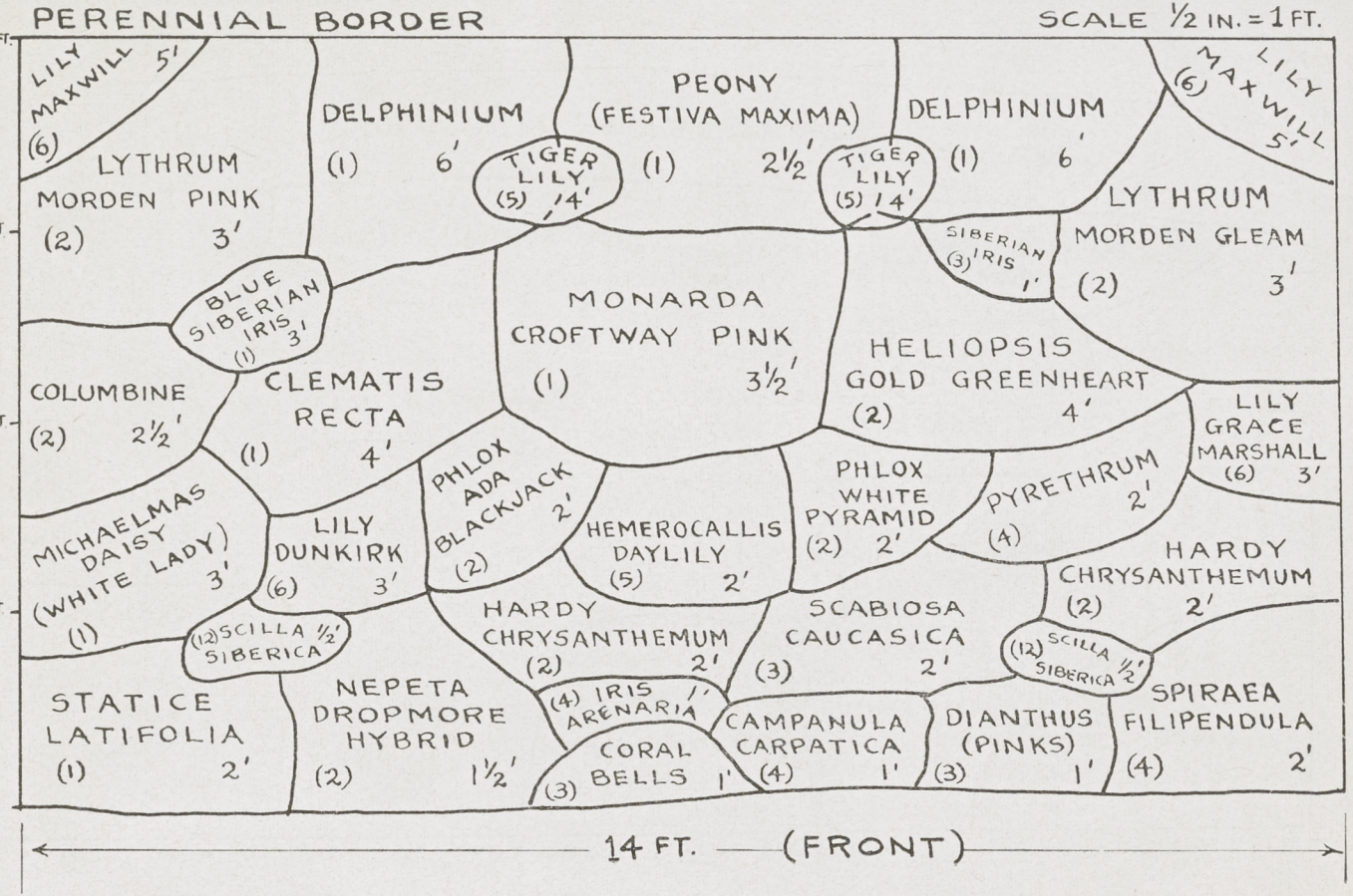
The kinds of annual flowers in this plan can all be counted on to germinate freely when sown in the border in May. The soil should be kept moist from the time the seed is placed. Thinning will commence when seedlings are less than two inches high, and will cease when only enough to furnish the area remain. The figures give the height of plants. This plan can be used as a guide for borders, four, six or eight feet wide. Hector Macdonald, F.R.H.S., Winnipeg, Man.

HARDY PERENNIAL BORDER PLAN

The numbers in the brackets indicate the number of mature plants required to furnish each clump. The plan is for borders, four, six or eight feet wide.

The materials have been chosen to provide a succession of bloom from May until the arrival of killing frost in autumn. The arrangement is planned so that early blooming subjects will be hidden as they ripen their foliage by clumps of later flowering kinds. In some cases the late bloomers will spread their growth over the early sorts.

The patch planting in masses presents a natural effect. Short statures are to the front, tall materials in the background. There is scope for wide diversity in kinds of perennials used. A first consideration is to plant so that the border will be beautiful continuously from early May on.—Hector Macdonald, F.R.H.S., Winnipeg, Man.



Notes on Potting Plants

by **S. J. WESTAWAY, B.A.**
Division of Plant Science, University of Manitoba
Stan is well known as the gardener on COUNTRY TIME, C.B.C. TV

1. Use clean clay pots or containers. New pots should be well soaked before using.
2. To aid in cleaning used pots allow them to soak for a number of days in slightly soapy water. Scrape off scale and scrub well. Rinse thoroughly in clean water.
3. If you use cans or similar containers punch sufficient holes in the bottom to provide drainage.
4. Always place some broken crockery or coarse gravel over the drainage holes to prevent soil from blocking the drainage. Vermiculite or coarse organic material should be placed over this before adding the soil.
5. The bottom of porcelain containers or planters without drainage should be carefully prepared with coarse porous material (broken crockery or vermiculite) to a depth of one inch or more before placing soil. Add some broken charcoal to this to prevent souring. Powdered charcoal may also be added to the soil. Careful watering is very essential in such containers. Do not allow the soil to become waterlogged. Add sufficient water to thoroughly moisten the soil. Only water again on the point of dryness.
6. Use a loamy soil wherever possible for potting. If soil tends to be heavy or clayey add sand, peat moss, leaf mold or sifted, well rotted manure to lighten the texture of the soil. Soil should be sufficiently moistened for potting but not wet or doughy.
7. Use containers appropriate to the size of the plant. Repot to larger size when sufficient root development has taken place. Small plants in large containers often develop poorly due to waterlogging and subsequent poor root development.
8. Most plants require firm potting. Firm the soil with the pressure of the thumbs, tapping the pot on the bench to settle the soil — or by using a potting stick. Begonias, Gloxinias and African Violets prefer a rather loose soil, quite rich in organic matter to which some charcoal has been added. Woody plants should be potted quite firmly. This is where the potting stick is very useful. Firming the soil puts the roots in contact with the moisture and is one of the essentials to successful repotting.
9. Do not allow growing plants to become potbound. When an abundance of new roots have reached the outside of the soil ball, repot in a larger container. Potbound plants should be taken out, old roots trimmed off and the plant repotted in fresh soil.

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Canadian Industries Limited—C-I-L Polythene Film 102
Cyanamid Co. of Canada Limited—Cygon 2-E Pesticide 14
Dixon-Reid Company, Limited—Plant Food 102
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Eaton, T., Company of Canada ..... Inside Front Cover
Fisons (Canada) Limited—Diazinon Garden Spray 4
Fluorescent Sales & Service Limited ..... Inside Back Cover
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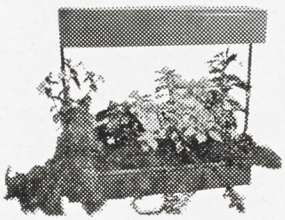
. . . STRENGTH - BEAUTY - CONVENIENCE

GRO - 89 — GRO - 80 fitted with Lighting Canopy. Canopy available in Jet Black, Sylvan Green or Eggshell finish.



GRO - 70 — TABLE MODEL Planter with Deep Pan also designed for use with Stands GRO - 71 or GRO - 72. Available in Jet Black, Sylvan Green or Eggshell finish.

GRO - 79—COMBINATION of GRO - 70 Planter and GRO - 72 Stand.

- Made of lightweight sheet metal.
- Planters finished in attractive, long lasting, baked enamel.
- Sturdy construction.
- Light reflector and Pan are removable for shipping, handling or storage.
- Light reflector is easily adjusted for height. (8").
- Reflector is designed to keep light below eye level.
- Electric cord contains handy on/off switch.
- All stands complete with two 20-watt fluorescent fixtures.
- Reflector designed to accommodate two 20-watt Plant Growth or Gro-Lux lamps.
- Fully C.S.A. Approved. Made in Canada.

For complete line of Gro-rite planters write to

Fluorescent Sales and Service Ltd.

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